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TREATMENT OF BLEEDING ESOPHAGEAL VARICES

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The problem of treating bleeding esophageal varices is a difficult one. Ratnoff and Patek [1] have shown that the first hemorrhage is fatal in one-third of these cases. Patek [2] states that the two-thirds of the patients who survive have only a 50% chance of being alive at the end of a year. It is clear from these findings that, in addition to controlling the initial hemorrhage, some definitive procedure is called for to prevent recurrences. According to Welch,[3] 85 to 90% of patients with portal hypertension will have liver disease. Since the work of Whipple [4] and of Blakemore and Lord,[5] porta caval anastamosis has become a valuable procedure in the interim control of hemorrhage from esophageal varices, but its complexity has proved too great for it to be used in poor risk patients or in instances of acute hemorrhage.

Numerous methods of controlling hemorrhage in the acute phase have been proposed.[6] Even when successful, however, these have failed to prevent recurrence. In poor risk patients, Everson and Cole [7] favor ligation of the splenic artery, a method originally described by Welch and Callow [8] and used successfully by Linton when he found it necessary to control hemorrhage immediately. In 1918, Blain [9] demonstrated that ligation of the splenic artery would cause atrophy but not necrosis of the spleen. It has been estimated [4] that the circulation through the spleen contributes approximately 40% of the portal blood volume. In reducing portal pressure, ligation of the splenic artery has been demonstrated to be more effective than splenectomy. A new approach to the problem of bleeding esophageal varices was suggested by Rienhoff's [10] report of six patients with portal hypertension who appear to have benefited from ligation of the hepatic artery.

Herrick [11] has shown that, in a patient with a normal liver, each rise of 40 mm. of water in arterial pressure causes a rise of 1 mm. of water in portal pressure; whereas, in a patient with a cirrhotic liver, each rise of 6 mm. of water in arterial pressure causes a rise of 1 mm. of water in portal pressure. "This mutual influence between the portal and arterial pressure within the liver," states Whipple, "provides an important explanation for the rise of portal pressure in portal cirrhosis and also explains the variability of portal hypertension in the cirrhosis as well as the presence or absence of gastrointestinal hemorrhage, as a measure of portal hypertension."

Markowitz, Rappoport, and Scott [12] demonstrated that antibiotic therapy could prevent liver necrosis after ligation of the hepatic artery. Berman, Koenig, and Muller [13] have postulated that ligation of the hepatic artery in portal hypertension due to cirrhosis will increase the effective portal flow of blood to the liver cells and, at the same time, reduce the portal pressure, thereby improving liver function. In the literature, no report is to be found of recourse to hepatic and splenic artery divisions during active bleeding; the foregoing theoretical and practical evidence appeared to make such a maneuver feasible. Three patients are reported here in whom hepatic and splenic artery divisions were performed during acute bleeding from esophageal varices with portal hypertension secondary to intrahepatic disease.

REPORT OF CASES

CASE 1.—A 61-year-old fireman was admitted to the hospital on Dec. 15, 1951, shortly after vomiting approximately a pint of bright red blood. The patient's history was not revealing except for an appendectomy in 1905 and an ankle fracture in 1935. He stated that he had noted gradual loss of hearing during the past few years. He had for many years been in the habit of drinking from 6 to 12 bottles of beer daily and, occasionally, wine and whisky. Rarely, after drinking, he would have some epigastric distress but no other symptoms suggestive of ulcer. Shortly after admission, he vomited more bright red blood containing clots. The physician present estimated the amount vomited was approximately one liter.

Physical examination showed a well-developed, 200 lb. (90.7 kg.), gray-haired man, with cold, sweaty skin. He was covered with dried blood. Vital signs were blood pressure, 90/70 mm. Hg; temperature, 99 F; pulse, 130; and respiration, 20. There was a well-healed scar over the occipital area. The mouth was filled with fresh blood. Examination of the heart revealed a grade 1 apical systolic murmur. The abdomen was not distended. The liver was palpated 4 cm. below the costal margin.

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The kidneys and spleen were not palpable. Peristalsis was active. Moderate external and internal hemorrhoids were present; the stool showed a 4+ guaiac reaction.

The patient continued to vomit bright red blood frequently, despite gastric suction with a Levin tube. He was given 3,000 cc. of whole blood in an eight hour period. After an initial improvement, the patient's condition became worse; a hypotensive state returned, blood pressure 100/60 mm. Hg, and tachycardia developed, pulse rate 130 per minute. After an initial rise, the hemoglobin level fell to 9 gm. per 100 cc. The icterus index on one occasion was 15, but, on all other determinations, it was normal. Sulfobromophthalein (Bromsulphalein) retention (patient's weight estimated) after 45 minutes was 9%.

In view of the patient's condition, a gastrointestinal series was deemed inadvisable. He was taken to the operating room for esophagoscopy. The endoscopist reported that 43 cm. of the esophagus was examined; there was a good deal of blood coming from the distal portion of the esophagus; the visibility was poor, but there were no varices seen; and the bleeding seemed to be from the stomach, On the basis of this information, exploration was undertaken on the diagnosis of bleeding varices or bleeding ulcer.

The abdomen was entered through a high incision that split the left rectus muscle. Exploration revealed a small liver that appeared hob nailed, distended veins about the stomach, an area of subserosal hemorrhage on the lesser curvature near the esophagogastric junction, and an enlarged spleen estimated to be twice the normal size. A gastrotomy was performed. No ulceration could be found on sigmoidoscopic visualization of the stomach, duodenum, and esophagogastric junction, although numerous varices and vigorous bleeding were visualized at the esophagogastric junction. The stomach was closed, and the splenic artery was ligated and divided along the upper border of the pancreas, approximately 2 cm. from the celiac axis. The hepatic artery was then identified and divided between ligatures just distal to the gastroduodenal branch. The portal vein showed no thrombosis, and blood was readily aspirated from it. Pressure studies were omitted. With the evidence present, it was presumed that the portal tension was elevated and that it would be lowered by hepatic and splenic artery interruptions.

A liver biopsy was obtained (subsequently reported to show Laennec's cirrhosis) and the abdomen was closed by layers. During the immediate postoperative period, the patient became disoriented. Whether this represented delirium tremens or a manifestation of liver coma could not be determined. There was no clinical evidence of bleeding, however, and the stools, after four days, gave normal guaiac reactions. The patient's sulfobromophthalein retention dropped to 24% after 45 minutes. On several occasions, the cephalin flocculation was 3+. The prothrombin time reverted to normal. A gastrointestinal series on Jan. 8, 1952, was reported to be normal, and esophagoscopy failed to reveal any abnormalities except for a small area of esophagitis near the aortic arch.

On May 22, 1952, the patient was readmitted to the hospital with massive ascites. Numerous telangiectatic areas were present. Despite paracentesis and treatment with a salt-free, high carbohydrate, and high protein diet, the ascites persisted.

The patient was again admitted to the hospital on July 11, 1952, with massive upper gastrointestinal hemorrhage, which was controlled with a Sengstaken tube. The bleeding was presumed to be from varices.

CASE 2.—A 58-year-old white policeman was admitted to the hospital on the night of Dec. 24, 1951, after having vomited bright red blood copiously and frequently all day. The patient gave a history of an extensive daily intake of alcohol for many years. There was no other pertinent history.

Physical examination on admission revealed a well-developed white man with moderate jaundice and cold, clammy skin. The blood pressure was 140/75 mm. Hg; temperature, 99.2 F; pulse, 110; and respirations, 20. Telangiectatic angiomas were present on the right cheek and over the back of the shoulders.

During the 24 hours following admission, the patient vomited blood on several occasions and had blood diarrhea. His hematocrit was 33% on admission and fell to 28% after 24 hours, despite the administration of 2,500 cc. of whole blood. The blood pressure fell to 90/60 mm. Hg, and the pulse rose to 120. Sulfobromophthalein retention in 45 minutes was 51%, and prothrombin time was 23% of normal. A Sengstaken esophageal balloon was inserted, and an additional 2,000 cc. of whole blood was administered. Multiple doses of vitamin K and 1,000,000 units of penicillin were also given.

Despite some improvement, blood could still be aspirated from the stomach. At 4 p. m. on Dec. 26, 1951, exploration was undertaken with the patient under endotracheal anesthesia. The abdomen was entered through a high incision that split the right rectus muscle. Approximately 500 cc. of straw-colored ascitic fluid was encountered and aspirated. A biopsy of the hob-nailed, shrunken liver was reported to indicate cirrhosis caused by alcoholism. The spleen was enlarged to approximately twice normal size. The veins of the mesentery were markedly dilated, and there was edema of the retroperitoneal regions and of the stomach, duodenum, and jejunum. The splenic artery was divided between ligatures. During the dissection in preparation for division of the hepatic artery, which had an anomalous origin in the celiac axis, severe bleeding occurred and caused some difficulty in the subsequent procedure, although all blood lost appeared to have been replaced. The celiac axis was divided between ligatures; there was no further bleeding. The hepatic artery was also divided between ligatures that were beyond the gastroduodenal branch. The patient's blood pressure postoperatively remained at about 110/90 mm. Hg, and his pulse remained around 110, until four and one-half hours after completion of the operation, when he suddenly died. Permission for autopsy could not be obtained. The esophageal balloon had been released at the end of the operative procedure, however, and there had been no evidence of subsequent bleeding.

CASE 3.—A 37-year-old white woman was admitted to the hospital for the eighth time on March 14, 1952. According to the history obtained from the patient and from past hospital records, hepatitis had developed in 1948, after the patient had been given a course of injections for arthritis by a physician. Subsequently, her liver had become progressively smaller and her spleen progressively larger. She had been jaundiced constantly for two years, and, in 1950, ascites had developed and had persisted. Despite extensive therapy, the patient's prothrombin time had remained about 10% of normal and her platelet count about 100,000 per cubic millimeter. During the week before admission, the patient had had some "dizziness." She had not noted any change in the color of her stools. During the 24 hours before hospitalization, she vomited bright red blood, filling several emesis basins just prior and subsequent to admission.

At the time of admission, the patient appeared both acutely and chronically ill. She had slight icterus, noticeable in both skin and scleras. Spider angiomas were present over both arms and the right shoulder. The fingers showed spindle-shaped deformity consistent with rheumatoid arthritis. The abdomen was protuberant; umbilical and right lower quadrant incisional hernias were present; and prominent veins were noted. There was an abdominal fluid wave, and shifting dulness could be elicited. The spleen was palpated at the level of the umbilicus. The blood pressure was 90/65 mm. Hg; temperature, 100 F; pulse, 106; and respirations, 24. The hemoglobin level was 9 gm. per 100 cc.; hematocrit, 30%; sulfobromophthalein retention after 45 minutes, 45%; and prothrombin time, 48% of normal. Urine was normal except for a 1+ bile pigment content.

A Sengstaken esophageal balloon was inserted, but the patient tolerated it poorly. As she gagged frequently, fresh and old blood came up around the tube. Immediate operation was therefore undertaken. Splenic and hepatic artery divisions, as described in the previous case histories, were carried out. Ascitic fluid, 7,500 cc., was aspirated from the abdominal cavity. The liver appeared small and hob-nailed, and the spleen was estimated to be approximately five times normal size. The patient withstood the procedure fairly well, and, although she was semicomatose for the first 24 hours after surgery, she gradually returned to an alert mental state. On the seventh postoperative day, however, she had a severe gastrointestinal hemorrhage and died within a few hours.

The autopsy report stated that there was healed acute yellow atrophy of liver and focal areas of acute necrosis, which were probably the result of infarction; congestive splenomegaly; eso-

phageal varices and an esophageal tear; massive gastrointestinal hemorrhage, the site of which was not determined, and postoperative (six days) hepatic and splenic artery ligation and division. Other findings were healing focal interstitial myocarditis of unknown etiology; focal atelectasis and hemorrhage of the lower lobe of the left lung and interstitial edema and complete atelectasis of the lower lobe of the right lung; fat nephrosis, and chronic cholecystitis.

COMMENT

Since, in each patient described, the bleeding had stopped by the completion of the operative procedure, it appears reasonable to assume that the cessation was the result of the procedure. In the patient who failed to survive the operative procedure, the exact cause of death was not determined. It appears, however, that the procedure is too formidable for the poor risk patient. The increased ascites and the reduced liver function in two of the three patients would suggest that there is additional liver damage attendant on the procedure. In the two patients who survived the surgical procedure hemorrhage recurred in seven days (case 3) and five months (case 1).

SUMMARY AND CONCLUSIONS

Three cases are presented in which hepatic and splenic artery divisions were performed at the time of acute hemorrhage from esophageal varices secondary to cirrhosis of the liver. The bleeding stopped immediately, presumably as a result of the procedure. Bleeding recurred or death followed in each instance. These results have discouraged any further trial of this procedure.

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EXPLORATORY THORACOTOMY IN DIAGNOSIS AND MANAGEMENT OF CERTAIN PULMONARY LESIONS

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Repeated pleas for early detection of bronchogenic carcinoma have been published. Periodic thoracic roentgenograms, and particularly the mass surveys designed principally to find tuberculosis, have played important roles in answering these pleas; however, the entire array of diagnostic aids that is available today often does not provide the accurate diagnosis necessary for effective treatment of pulmonary diseases. We should like to emphasize the use of exploratory thoracotomy as a valuable diagnostic procedure and to decry the use of prolonged observation for diagnosis of certain pulmonary lesions.

DIAGNOSTIC AIDS

The symptoms of pulmonary disease offer little toward specific diagnosis. Often they seem insignificant to the patient, and members of the medical profession may erroneously concur in this impression. With monotonous regularity patients present themselves because of cough, hemoptysis, thoracic pain, dyspnea, wheezing, recurrent fever, arthritis, and easy fatigue. These symptoms, unfortunately, are common to both benign and malignant pulmonary disease. A diagnosis of virus or unresolved pneumonia may be made. Too soon, however, the appearance of hoarseness, bloody pleural fluid, symptoms referable to the central nervous system, or skeletal pain may herald the presence of metastasis, and occasionally these dreaded symptoms may be the first inkling of trouble to an otherwise healthy person.

Roentgenologic localization of disease is more satisfactory when referable to the lungs than to any other region of the body. Often the abnormal roentgenogram provides the only positive clue of serious pulmonary disease. Experience with roentgenographic patterns enables the roentgenologist to offer an opinion concerning the nature of the pulmonary lesion, and supplementary evidence provided by tomography, bronchography, and angiocardiography strengthens the accuracy of his opinion. For example, the presence of calcium in a pulmonary shadow is suggestive of a benign lesion and the distribution of the calcium is important. Granulomas often may be identified by the presence of laminated rings of calcium; however, identical shadows in the thoracic roentgenogram can be produced by a variety of benign and malignant processes, and roentgenographic examination does not provide a tissue diagnosis.

The value of bronchoscopic examination is unquestioned in the management of certain pulmonary lesions. In most instances it can be accomplished with minimal risk and discomfort for the patient. It plays a leading role in preoperative studies, particularly in providing a tissue diagnosis. Only a relatively small portion of the entire bronchial tree is accessible to the endoscopist, however, and Woolner and McDonald [1] noted the bronchoscopic biopsy was positive in only 41% of a series of 147 patients with bronchogenic carcinoma. When the endoscopist cannot inspect a lesion in situ, or secure a specimen for tissue diagnosis, he may yet aid in cytological examination.

Cytological examination of sputum is an outstanding advance in the diagnosis of pulmonary lesions. In cases in which sputum cannot be obtained, the endoscopist can secure bronchial washings for cytological and bacteriological study. In Woolner and McDonald's [1] series of 147 cases of bronchogenic carcinoma, mentioned before, a positive cytological examination of sputum or bronchial secretions was obtained in 68%. When cytological examination of bronchial secretions and sputum is made for the presence of bronchogenic carcinoma a

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1. Woolner, L. B., and McDonald, J. R.: Cytology of Sputum and Bronchial Secretions: Studies on 588 Patients with Miscellaneous Pulmonary Lesions, Ann. Int. Med. 33: 1164-1174 (Nov.) 1950.

positive result is reliable, but a negative result does not necessarily mean that the patient is free of such a lesion.

Obviously exploratory thoracotomy should not be resorted to if less formidable procedures can provide a diagnosis. Consequently, there has been a strong tendency among physicians in dealing with indeterminate pulmonary lesions to hesitate to subject a patient to a procedure that they believe to be hazardous. Nevertheless, a conservative procedure, such as biopsy of the lesion, segmental resection, or lobectomy, can be carried out in most instances, and the diagnosis can be established by the surgical pathologist while the patient is still on the operating table. This last is of utmost value. For example, the gross characteristics of a lipoid granuloma of the lung can mimic perfectly those of carcinoma, and, without microscopic confirmation, the surgeon might perform an unnecessary, extensive, pulmonary resection. The risk of exploratory thoracotomy today certainly is not more than that of exploratory laparotomy, and no longer is the policy of "wait and see" justifiable. The physician, not time, should make the diagnosis of pulmonary disease.

SURGERY FOR DEFINITE DIAGNOSIS

From April, 1947, to December, 1951, inclusive, a number of patients with localized pulmonary lesions were operated on by one of us (O. T. C.). Of these, we have examined the records of 356, excluding from that number, in so far as possible, cases in which bronchiectasis, lung abscess, cystic pulmonary disease, or tuberculosis was present. Thirty different pathological conditions were found at thoracotomy in the 356 cases; of these cases the lesions were benign in 119. Almost without exception, the lesions were of types best treated by resection. Exploratory thoracotomy for diagnosis of indeterminate pulmonary lesions thus led to a therapeutically valuable procedure whether the condition was malignant or benign. Extensive resection (pneumonectomy) was performed only when it was required by the extent or nature of the lesion (table 1). The cases were thoroughly worked up, and all indicated examinations were performed. Yet, resort to exploratory thoracotomy was necessary to definite diagnosis in 180 of the 356 cases (50.6%). In table 2 are listed the pathological lesions found in the 180 cases.

TABLE 1.—*Hospital Mortality in 356 Cases in Which Thoracotomy Was Performed*

Condition	No. of Cases	Mortality	
		Cases	Percentage
Pneumonectomy	138	4	2.9
Lobectomy and segmental resection *	112	6	5.4
Exploratory thoracotomy	59	1	1.7
Local excision	47	0	0.0
Total	356	11	3.1

* Segmental resection, 14 of the 112.

At this point, again, the diagnostic and therapeutic problems merge. Of the 180 lesions, 65 were granulomatous processes. In our experience, bacteriological studies of granulomatous lesions can be expected to disclose an etiological agent in only about 20% of cases. However, the danger of breakdown and dissemination of a pulmonary granuloma is a constant threat to the patient, and removal can be accomplished with minimal risk. We cannot say that every circumscribed benign lesion is best resected, but they all present an elusive diagnostic problem that usually is not solved until the time of exploratory thoracotomy. In addition, as has been said, the pathological nature of benign lesions removed in this series of cases was such that resection ordinarily would be the treatment of choice.

TABLE 2.—*Types of Pulmonary Lesions Found in Cases in Which, Prior to Exploratory Thoracotomy, Lesions Had Been of Undetermined Nature*

Lesion	No. of Cases	Percentage
Bronchogenic carcinoma	54	30.0
Granuloma	65	36.2
Hamartoma	12	6.7
Chronic pneumonitis	12	6.7
Bronchial adenoma	7	3.8
Broncholithiasis	5	2.8
Miscellaneous	25	13.8
Total	180	100.0

It is necessary now to consider the material from a different standpoint, namely, from that of the diagnosis and treatment of bronchogenic carcinoma. Of the 356 patients in this series, 203 had bronchogenic carcinoma. The diagnostic means were various. The lesions in 37 (18%) of the 203 cases were found by routine roentgenologic examination, in the absence of symptoms. In 190 of the 203 cases, cytological examinations were made, with positive results in 60%. If it were possible for the cytologist to examine an adequate number of specimens from each patient, his percentage of positive results undoubtedly would be increased. Bronchial secretions or washings sometimes provided a positive cytological diagnosis, even though a lesion could not be subjected to biopsy. In those of the 203 cases in which bronchoscopy was done, a positive tissue diagnosis was obtained in 36%. In an additional 23%, a lesion or other evidence of pathological change was detected by bronchoscopy, although a positive biopsy could not be obtained. By including these latter cases, the bronchoscopic examination proved of positive value in 59% of the group. However, this study demonstrated that in more than 25% of cases of bronchogenic carcinoma exploration must be made to establish the diagnosis. It has been brought out that 37 of the 203 cases were symptomless. In only 1 of the 37 cases was the carcinoma inoperable at the time of exploration. On the other hand, in the remaining 166 cases of the 203, there were symptoms from the pulmonary carcinoma and, of these, in 59 (35%) the lesion was inoperable.

In table 1 is represented the risk of exploratory thoracotomy and pulmonary resection in this series of 356 cases. There were 11 deaths, a total hospital mortality rate of 3.1%. All the deaths except one were of patients who underwent resection for malignant pulmonary lesions, and in that one case extensive pulmonary resection was necessary on a patient 1 year of age. The relatively high mortality among those who underwent lobectomy is explained by the fact that the general condition and pulmonary reserve would not permit even

the conservative procedure that was attempted in the interest of the patients. Some patients may believe that they have much to lose if the thorax is explored and a benign lesion is found. They have life itself to lose, however, if a lesion of undetermined nature turns out to be malignant.

SUMMARY AND CONCLUSIONS

In spite of the fact that all nonsurgical diagnostic adjuncts were employed, establishment of a definite diagnosis required resort to exploratory thoracotomy in approximately 50% of 356 cases of localized pulmonary lesions. Approximately 30% of 180 lesions of previously undetermined nature proved, on exploration, to be bronchogenic carcinomas. There were 203 cases of bronchogenic carcinoma in all, and, in about 25% of these, the diagnosis could not be made without exploratory thoracotomy.

That carcinoma of the lung could be diagnosed early was evidenced by the fact that 18% of the 203 patients with bronchogenic carcinoma in this group were operated on before they had symptoms. There was only one inoperable carcinoma among the 37 patients without symptoms, whereas there were 59 inoperable carcinomas among the 166 patients who had symptoms.

Early diagnosis and effective treatment of carcinoma of the lung require that exploratory thoracotomy be accepted as a means of establishing the diagnosis of certain pulmonary lesions of previously undetermined nature. The value of the procedure is greatly enhanced by close cooperation between surgeon, pathologist, and bacteriologist.

The risk of exploratory thoracotomy is slight, and securing an accurate pathological diagnosis does not require sacrifice of normal pulmonary tissue.

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MANAGEMENT OF NOCTURNAL ENURESIS BY CONDITIONED RESPONSE

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Treatment of chronic nocturnal enuresis often poses a vexing problem, and even prolonged programs employing the conventional therapeutic methods are frequently fruitless. That this is a major problem, especially in pediatrics, is attested to by estimates of up to 16% incidence in the child population [1] and also by the profuse literature on the subject. Although the incidence is smaller in higher age brackets, enuresis presents the adult patient with a serious problem that often has a pronounced effect on his social adjustment. A few cases of enuresis, variously estimated at from 3 to 10% [2] of the total, arise from definite anatomic or physiological anomalies for which specific surgical or medical procedures are indicated. The majority of cases appear, however, in children who simply have never been able to respond to the stimulation of a full bladder by awakening. After the age of 3 or 3½ years, when the average child becomes a deep sleeper, self-training becomes even more difficult.

I shall not attempt to establish the causes of enuresis, since I feel that there is a wide variety of causes, from "laziness" to deep psychic disturbance.[3] Rather, it is my purpose to encourage more general use of conditioned response therapy. I feel that the response to such therapy is rapid, complete in most instances, and relatively simple. In my experience, it not only has been harmless to patients with an emotional disturbance, but in every case has resulted in an apparent feeling of accomplishment that aided in subsequent psychiatric adjustment. As to the necessity for satisfactory treatment, one need only listen to the mother of a 10-year-old enuretic child or to the embarrassed plea of the boy about to go to scout camp.

Considerable success has already been reported in controlling enuresis by conditioning a patient to awaken in response to bladder tension rather than yielding to the urge to urinate.[4] The cases in the present report were all managed by this conditioned response method, with about 91% successful results. It must be emphasized that all the children in this group had previously unsuccessfully tried the usual procedures, such as restricting fluids or earning awards. This report is based on the study of 42 case histories. Every case was managed in the patient's home under the guidance and supervision of the prescribing physician. Cases were unselected, except that no patient was treated by this method without a previous physical examination and routine urine test.

METHOD OF TREATMENT

The object of this treatment is to teach the enuretic to respond to nocturnal bladder tension by awakening rather than by urinating. This conditioned response is established with the aid of an automatic electric alarm device, which awakens the patient immediately each time micturition begins. Once this response pattern has been established, the patient tends to sleep for increasingly longer periods before awakening and eventually sleeps through the entire night. The apparatus used operates on small, self-contained batteries, with no danger of electrical shock to the patient. The alarm is contained in a small cabinet placed on a night stand near the head of the patient's bed. The patient sleeps directly on a moisture-sensitive bed pad, which is connected to the alarm cabinet by an electric cord and plug. Whenever micturition begins, the first few drops of urine moistening the pad render it sufficiently conductive to permit the passage of an electric current, which, though feeble, is capable of

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setting off the alarm. Awakening in response to the alarm bell, the patient ceases voiding (the wet spot on the pad is seldom larger than a silver dollar), silences the alarm by means of a switch, and goes to the bathroom to complete urination. Before the patient returns to bed, the alarm is conditioned for reuse by replacing the wet pad with a dry one.

Since every treatment was carried out in the home and the majority of the subjects were young children, close supervision and cooperation of the parents was required. In addition to simple instructions for proper use of the apparatus, parents were briefed on the psychological aspects of the therapy. The classical principle of Pavlov was explained. They were impressed with the fact that the alarm device is not a treatment in itself but rather an effective tool to be used in developing a conditioned response and that, like all tools, it must be used properly to obtain the most satisfactory results. Parents were given the following specific instructions: 1. The patient must awaken immediately when the alarm sounds. If he sleeps too soundly, someone must sleep nearby to awaken him. (It was found that even the heaviest sleepers learn to respond to the alarm bell alone after being assisted in this manner.) 2. After being aroused by the alarm, the patient must be thoroughly awakened before he goes to the bathroom. Sleepwalking to the bathroom may actually reinforce the habit of urinating while sleeping and thus defeat the purpose. The alarm bell should be allowed to ring until the patient is sufficiently aroused to turn it off himself. 3. The patient must never be allowed merely to turn off the alarm and go back to sleep. 4. An attitude of sympathetic assistance and cooperation is of primary importance. 5. Use of a night light is recommended, especially for sound sleepers. The patient awakens more easily and with less confusion. 6. It is best for the patient to sleep naked from the waist down to insure urine reaching the pad promptly, but the wearing of pajamas should be resumed during the last week that the alarm is in use in order to return as nearly as possible to normal conditions before the alarm is removed. 7. Ingestion of liquids should not be restricted. In fact, if the patient normally wets the bed sporadically, copious drinking in the evening, especially of mildly diuretic soft drinks, may be helpful in giving the patient more frequent experience with alarms. 8. The patient (or parent) must report to the physician weekly, describing exactly how the alarm is being used and how the patient reacts. (Each patient or parent was given a progress record chart on which to record the times he was awakened by the alarm and the times he awoke in response to bladder tension alone.)

During the weekly conferences, the physician has an opportunity to visualize the patient's reaction pattern and correct any procedures and practices being used by the patient or parent that may be incompatible with the establishment of the desired conditioned response. In each case, the alarm was used for at least one week after the last wetting incident occurred. In doubtful cases, such as those of sporadic wetters who might normally experience a week or more of dry nights or cases in which progress had been slow and uncertain, a longer "dry" period was employed, depending on the circumstances.

RESULTS

In 38 (90.48%) of the 42 patients managed in this manner, enuresis was arrested. Five in whom treatment was successful reverted to the old habit, but four of these promptly responded to a repetition of the treatment, and the fifth is being treated similarly at this writing. Seventy-four per cent of the patients treated successfully were eventually able to sleep through the entire night (many of them had achieved this by the time the alarm was removed), and 85% showed noticeable improvement in emotional stability and personality adjustment. Duration of therapy varied from 1 to 15 weeks, the average being 4½ weeks. In one of the patients in whom this treatment failed enuresis was later arrested by psychiatric management, and, conversely, four of the patients in whom it was successful had previously resisted psychiatric efforts.

In seven patients enuresis had begun at the age of 3 or 4 years, but in all others it had persisted since birth. Corrective measures previously employed included use of drugs in 30% of the patients, systems of rewards in 54%, punishment in 24%, restriction of liquids in 80%, psychiatric treatment in 8%, hospitalization in one case, and arousing at regular intervals in 60%. It is significant that in the system of taking the child to the bathroom at regular intervals during the night, all but two of the children were reported to have been not thoroughly awake when this was done. All but two of the patients were sound sleepers. Forty-three per cent of the patients had a history of one or more cases of enuresis in the father's or mother's family, usually including the father or mother. Seventy per cent of the patients were males, and 74% were in the 5 to 10 year age group.

Examination of the record charts for all patients reveals a rather typical progress pattern, consisting of four distinct stages; however, the duration of each stage varied considerably with different patients, and certain stages were omitted entirely in some cases. Typical treatment in a patient who wets every night progresses as follows:

Stage 1.—In the first stage, the patient wets with the same frequency, usually two or three times nightly, as has been his habit before beginning the treatment. At each wetting the alarm bell awakens him and he goes to the bathroom to complete urination. Duration of this stage is usually less than one week, and the frequency of alarms decreases toward the close of this stage.

Stage 2.—In the second stage, the patient begins to awaken in response to the stimulus of bladder pressure alone on some occasions, but he still wets and sets off the alarm on other occasions. The desired conditioned response is beginning to appear but is not yet firmly established. During this stage, alarms decrease and dry nights increase in frequency.

Stage 3.—When the patient no longer wets the bed, the third stage has begun. He awakens once or twice a night to go to the bathroom, or he may sleep through some or all of the nights. The alarm does not operate, but the patient is aware of its presence. When this stage has continued for 7 to 10 days, the fourth stage is considered to have begun, and the alarm is removed.

Stage 4.—The patient is on his own in the fourth stage. He may arise from time to time to go to the bathroom

at night, but he tends to sleep for increasingly longer periods and, eventually, to sleep through the entire night.

Patients commonly develop sufficient confidence by the end of the third stage to request removal of the alarm, but, if the patient seems uncertain or if his progress has been slow and irregular, use of the alarm is continued for an additional week or more. Some patients sleep through the night after the third stage, while others may prolong the fourth stage for weeks or months, but the nuisance and embarrassment of bed wetting have ceased. The patient's progress chart usually reveals these stages clearly and aids the physician in deciding when to remove the alarm. Sporadic wetters were the slowest to respond, and the stages of progress were sometimes difficult to recognize in such cases.

COMMENT

The chief cause of failures unquestionably was poor parental cooperation. In a number of patients, enuresis was arrested despite poor or no parental cooperation, but progress in these cases would probably have been more rapid with more intelligent home management. Some parents regard the alarm as a complete mechanical treatment in itself and shun the responsibilities of seeing to it that the subject awakens immediately, is wide awake, and is never allowed to merely turn off the alarm and go back to sleep. In several cases the parents became discouraged if the child was not cured after three weeks and discontinued the treatment prematurely. Some parents could not force themselves to "unduly disturb" their children by thoroughly awakening them after they were aroused by the alarm, and in one patient ephedrine was clearly indicated and prescribed, but the parents declined its use because of their antipathy to the use of drugs in general. These same parents failed to contact the physician regularly for fear of incurring a fee that they thought unnecessary and were frequently too "tired" to get up with the boy when the alarm sounded. Failure in this case was not surprising.

The auxiliary use of ephedrine or a similar agent is beneficial in cases in which the subject sleeps so soundly that the alarm bell alone cannot arouse him. Many of the patients were very sound sleepers, and it was occasionally necessary for a parent to sleep nearby and awaken the child at each alarm. In the majority of cases, the patient learned to respond alone after being assisted in this manner for the first few nights, but if he did not do so after 7 to 10 nights, ephedrine was prescribed. The dose was decreased by a factor of one-half each succeeding week after the patient began to respond.

While this conditioned response method seems to have been used more extensively in Europe and Australia than in this country, the method recently has been gaining in popularity here. Several versions of the apparatus have appeared on the market. Whatever mechanical merits these respective devices may or may not have, it is regrettable that the majority of them are offered directly to the public without the prescription or supervision of a practicing physician. Over-the-counter marketing is, of course, conducive to self-diagnosis and treatment and may result in indefinite postponement of needed medical or surgical treatment in patients with organic disease. Probably, it is possible to establish the conditioned response in a patient with organic disease, which then persists and develops undiscovered in the "cured" patient. Although the incidence of organic lesions is low, they must always be suspected until proved absent.[1] It is also desirable for the treatment to be under the physician's guidance because the majority of parents cannot be expected to be sufficiently acquainted with the psychological principles involved to diligently follow the most effective procedures and avoid those that may be incompatible with the establishment of a conditioned response.

The use of this method in cases of possible psychiatric origin has been questioned on the ground that it is symptomatic treatment. In discussing this point in their report of cases treated in this manner, Davidson and Douglass conclude, ". . . we feel that in a good many cases personality difficulties are the effect rather than the cause of the enuresis."[4b] Again, Hubble writes, "The disorder [enuresis] persists long after the precipitating situation has disappeared and been forgotten."

SUMMARY AND CONCLUSIONS

Treatment of a group of 42 patients with chronic nocturnal enuresis by development of a conditioned response is described. All patients, after examination to rule out organic lesions as a cause, were treated by being awakened immediately after the commencement of nocturnal urination by an automatic electric alarm. The purpose of this procedure was to condition them to awaken instead of urinate in response to bladder tension. All patients had resisted a variety of treatment methods previously. Enuresis was arrested in 38 (90.5%) of 42 patients, and the majority of these patients eventually learned to sleep through the entire night; five required a second treatment after reversion, and in four the treatment was unsuccessful. Parental cooperation is of primary importance for success in the case of young children, and lack of it is the commonest cause of failure; hence, professional supervision is an important feature of the treatment. Personality difficulties improved considerably in the majority of patients, indicating that such maladjustments may often be the effect, rather than the cause of enuresis. The conditioned response management of enuresis appears to offer a positive method of attack on a common and stubborn affliction and its attendant personality difficulties.

113 N. Carroll St. (3).

Cancer of the Larynx.—Although hoarseness is the most common presenting symptom in cancer of the larynx, nonspecific complaints such as cough, decreased general vigor, dysphagia or dyspnea, with or without hoarseness, occur with sufficient frequency in this disease to warrant investigation of the larynx in any patient over forty with these complaints. . . . Indirect (mirror) laryngoscopy should not be relied upon to exclude cancer of the larynx in suspected cases. As Jackson has said, "Death often lurks under an overhanging epiglottis." Direct laryngoscopy will reveal tumors situated in the anterior commissure, ventricle, pyriform sinus, laryngeal surface of the epiglottis and other locations sometimes inaccessible to the mirror. Initial biopsy was negative in 14 per cent of the patients . . . who later were found to have cancer of the larynx. This illustrates the need for a close follow-up by a competent otolaryngologist, of any case of "chronic laryngitis" in a patient over forty.—J. S. Malkin, M.D., and J. A. Kirchner, M.D., Cancer of the Larynx in General Practice. *Connecticut State Medical Journal*, November, 1952.

METHODS OF TREATMENT OF DELIRIUM TREMENS

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Delirium tremens was first described by Sutton in 1813. Since that time many treatment approaches have been used, but the cause is still obscure. The frequency with which the condition is seen in hospitalized alcoholics varies in different series from 6.2% to 32%.[1] It is not unusual to find a chronic alcoholic, however, who has had delirium tremens with transitory visual and auditory hallucinations on several occasions but has been hospitalized only once or twice. Therefore it would seem safe to presume that the individual patient may have incipient delirium tremens without seeking hospitalization, and that the frequency is higher than the records of alcoholics admitted to hospitals would indicate.

Delirium tremens may be divided into two phases: the incipient stage in which only tremors and marked apprehension exist, and the stage of active delirium tremens in which the patient is hallucinating and delirious. Alcoholics differentiate the two phases by labeling the incipient stage as "the shakes" and the stage of active delirium as "the horrors." An intermediate stage is described by some alcoholics in which extensor spasms or convulsions occur; this phase is referred to as "the rams." This is a subjective classification that adequately describes the patient's sensations.

The reported mortality in delirium tremens varies in different series from 1.3% to 37%. During the last decade the mortality in uncomplicated delirium tremens in most reports has been approximately 5%. Prior to the advent of the antibiotics and sulfonamides, the mortality in delirium tremens complicated by cranial injuries, fractures, or infection was extremely high.

This condition becomes manifest after a prolonged bout of drinking and an inadequate diet; usually this period of excessive drinking is from two to six weeks. Prior to the onset of the active delirium, the patient has insomnia, with little or no sleep for several days, an increasing agitation, a fearful apprehension, and paranoid ideas. Anorexia and food intolerance may accompany this toxic state, which is further aggravated by vomiting and diarrhea. Occasionally gross blood or "coffee ground" material may be vomited, resulting either from a severe gastritis or a ruptured esophageal varicosity. The patient may have abdominal pain with a rigid abdomen, the so-called rum belly. There is a diversity of opinion as to whether these abdominal symptoms result from acute pancreatitis. Occasionally an episode of alcoholic delirium or incipient delirium is followed by the development of marked abdominal distention; such patients may show an increase in blood amylase. In these persons pancreatic involvement is assumed and in addition marked hepatomegaly is usually demonstrable; a medical approach is followed in the treatment of these patients.

Convulsions during the delirious state are not rare, and in the past were described as "alcoholic epilepsy" or "rum fits." Greenblatt and associate were unable to demonstrate an increased incidence of abnormality in the electroencephalographic tracings of patients with convulsions during the delirious phase. This finding and the infrequency of the seizures during periods of prolonged abstinence would make the diagnosis of epilepsy doubtful in such patients.

When first seen, these patients are poorly nourished, dehydrated, and show a marked tremor of the hands, tongue, and lips; the deep reflexes are exaggerated and the patient as a rule is in a state of panic. Occasionally a peripheral neuritis is noted, with foot or wrist drop ("Saturday night palsy"); in such an instance, the reflexes are diminished or absent. The pupils are usually small and react sluggishly to light.

The anxiety may be of such a degree as to keep the patient in a condition of sustained panic, depression is frequent and severe, and suicide is not rare. The patient, being in a state of fearful apprehension and increased suggestibility, interprets any sudden stimulus as a danger. For instance he may think a door banging is someone shooting at him, or he may walk about with reluctance for fear of stepping on his glasses, which he thinks he sees on the floor. Haptic sensations may be the most troublesome, with the patient seeking an imaginary pin that is sticking him or brushing away imaginary insects from his skin. One patient reported a unique experience in which she had the sensation "of being rained on and feeling wet" but all the while observed that other persons were not similarly affected. Bizarre and threatening animals may also be hallucinated and reacted to, or inanimate objects may show unnatural behavior, such as a fish mounted above a bar speaking to a patient in a derogatory manner.

Some alcoholics who at first categorically deny any hallucinatory or other unusual experiences may later admit to transitory phenomena that are not observed in normal persons. It is not unusual for a chronic alcoholic to awaken during or after a bout convinced that he has committed a serious crime; he is unable to remove the idea from his mind until he has been reassured or has investigated for himself. For instance, an alcoholic, who has never been hospitalized for delirium tremens, awoke after a short nap with the unshakable idea that he had murdered his wife. He was so certain that he had killed his wife that he went to inspect her remains where he thought he had left her. He was overjoyed to find his wife whole and hearty, but did not trouble himself to explain his sudden pleasure in seeing her again. It is doubtful if the wife would have shared his enthusiasm had she known the basis of his affection. Such experiences are similar to disturbing dreams, but the patient is unable to accept them as imaginary after he is awake.

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1. (*a*) Chapman, C. B.: "Delirium Tremens," New England J. Med. **231**: 249-255 (Aug.) 1914. (*b*) Moore, M., and Gray, M. G.: Delirium Tremens: A Study of Cases at Boston City Hospital, 1915-1936, ibid. **220**: 953-956 (June 8) 1939.

The patient is extremely suggestible and may, if told to do so, read words on a blank wall. Having patients read what does not exist may lead to unforeseen difficulty; one patient, when told to read the writing on a blank wall, peered intently at the clear wall, became quite belligerent, and shouted "Who wrote that about me?" The patient feels constantly threatened by his hallucinatory experiences and may attempt to escape them or may seek to eliminate the cause of his torment. The element of fear is a constant finding, and gives rise to the alcoholic's very descriptive term, "the horrors," for this state. The patient is disoriented, misidentifies other persons, is extremely restless, and is unable to sleep. As previously stated, delirium tremens is usually preceded by a period of heavy drinking; however, alcoholics seem particularly prone to develop delirious states postoperatively, following trauma, or during a systemic illness even though they may have been abstinent for several weeks or months.

After recovery from an episode of delirium tremens the patient may retain a vivid memory of his ideas and fears. This may be sufficient to prevent his drinking further; too, those who have had repeated episodes may seek medical attention while they are in the incipient stage in the hope that medical treatment will enable them to escape the "horrors" or state of active delirium.

TREATMENT

The treatment of delirium tremens is primarily symptomatic. The question as to whether or not the sudden withdrawal of alcohol is a precipitating factor in the development of delirium tremens was long debated. Scott in 1911 reported the results of medical treatment in 1,106 cases, and concluded that whiskey was indicated in the incipient state (along with barbital and ergot) but was contraindicated in the delirious state. This opinion that alcohol should be given was not unanimously accepted by other authors. For the past 20 years alcohol has been less frequently recommended as a part of the treatment of delirium tremens. The opposition to its use arises both from doubt as to its beneficial and possibly harmful effects physically and fear of creation of an even greater emotional dependence on alcohol. Piker,[2] in 1939, found that 75% of the patients admitted for delirium tremens had developed this difficulty while still drinking, which would rule out abstinence as a cause; he also cites the very rare development of delirium tremens in chronic alcoholics in jail. Abstinence is no longer generally accepted as a cause for delirium tremens.

In 1915 Steinebach [3] described cerebral edema as the cause of delirium tremens, and from his description the "wet brain" theory was evolved for which repeated spinal drainage was recommended. Steinebach also believed, however, that a "toxin" was present in the cerebrospinal fluid and he replaced the fluid that was removed with isotonic sodium chloride solution in an attempt to dilute this postulated toxin.

Cerebral edema or "wet brain" as the cause for delirium tremens has been questioned by Rosenbaum,[4] who found the spinal fluid pressure to be normal in 73% of 211 cases in which the pressure was measured, in spite of the patient's difficulty in cooperating in the procedure. Bowman and Wortis,[5] and Thomas and co-workers in 1939 advocated forcing fluid (3,000 to 4,000 cc. per day) to combat the usual state of systemic dehydration and the administration of sodium chloride orally to restore a normal acid-base balance.

This was an "about face" in the treatment of delirium tremens from the previously recommended routine of further dehydration by limiting fluid intake and purgation to combat the postulated cerebral edema ("wet brain"). With this new regimen they reduced the mortality in their series to 4.6% from a previous level of 16%. In another study Bowman [5] found that giving 2 gm. of sodium chloride every four hours the first day and forcing fluid reduced the period of delirium to 2.1 days in patients so treated as compared to 4.5 days in controls. Kennard and associates found the ratio of urinary sodium and chloride excretion to be abnormal in 18 or 19 patients studied; in 11 there was a decreased excretion of chloride in the urine, from which it was concluded that an excess loss of chloride had occurred immediately before or during the episode of delirium tremens. In seven other patients more chloride than sodium was being excreted; in both variations the ratio returned to normal in one to four days. Cohn [6] found in delirious patients hemoconcentration, hypochloremia, low alkali reserve, and decrease in total base; recovery from the delirium was accompanied by a restoration of the body fluids and electrolytes to normal.

The role of vitamin deficiency in the development of delirium tremens has not been clarified; presently an adequate vitamin intake is recommended to compensate for the avitaminosis that accompanies the malnutrition usually found in patients with delirium tremens. Jolliffe,[7] Bowman, and Rosenblum report a syndrome in chronic alcoholics in which the following signs are noted: clouding of the consciousness, cogwheel rigidities, and uncontrollable sucking and grasping movements, which may or may not be associated with a polyneuritis resulting from a thiamine deficiency. This syndrome is attributed to encephalopathy due to nicotinic acid deficiency; this deficiency is considered to be total in this state as opposed to pellagra in which it is partial. Patients showing these symptoms had a mortality of 100% when treated by hydration alone; the mortality decreased to 13.6% when they were treated with nicotinic acid as well. Piker reports an interesting isolated instance of delirium tremens developing in a person receiving an adequate intake of thiamine chloride (50 mg. daily hypodermically) and nicotinic acid (500 mg. orally). This patient while hospitalized drank 12½ qt. (12,500 cc.) of 90 proof whiskey in 14 days; he ate poorly but drank large quantities of milk during this period, and on the 13th day delirium tremens developed. The finding of a toxic myocarditis and acute cardiac dilatation in patients dying

2. Piker, P.: On Relationship of Sudden Withdrawal of Alcohol to Delirium Tremens, Am. J. Psychiat. **93**: 1387-1390 (May) 1937.

3. Steinebach, R.: Treatment of Delirium Tremens by Spinal Drainage, Deutsche med. Wchnschr. **41**: 369-372, 1915.

4. Rosenbaum, M.; Piker, P., and Lederer, H.: Delirium Tremens: A Study of Various Methods of Treatment, Am. J. M. Sc. **200**: 677-688 (Nov.) 1940.

5. Bowman, K. M.; Wortis, H., and Keiser, S.: The Treatment of Delirium Tremens, J. A. M. A. **112**: 1217-1219 (April 1) 1939.

6. Cohn, C.: Chemical Studies in Delirium Tremens, J. Lab. & Clin. Med. **27**: 63-67 (Oct.) 1941.

7. Jolliffe, N.; Bowman, K. M.; Rosenblum, L. A., and Fein, H. D.: Nicotinic Acid Deficiency Encephalopathy, J. A. M. A. **114**: 307-312 (Jan. 27) 1940.

in delirium tremens was the basis of the administration of digitalis. The hope that digitalis would prevent this dilatation was the rationale of its use.

Perhaps the most comprehensive clinical evaluation of the results of treatment in delirium tremens has been done by Piker. He compared those patients receiving digitalis with a similar group who were not digitalized, and found no significant difference in mortality or morbidity in the two groups. Dehydration and hydration were equally ineffective in altering significantly the mortality or morbidity.

SEDATION

The amount of the barbiturate required to control alcoholic delirium is so great as to make its use hazardous. In inadequate dosage barbiturates may increase the delirium or make the patient even more difficult to manage.

Mephobarbital (mebaral®), the trimethyl derivative of phenobarbital, has been found effective in controlling the tension and irritability seen during recovery from delirium tremens. This drug produces no euphoria and no tendency to habituation has been noted; also it does not produce the clouding of consciousness and restlessness that frequently result from the use of the short-acting barbiturates. The dosage is 3 grains (0.2 gm.) four times a day.

In patients with severe liver disease barbital (veronal®), which is excreted entirely by the kidney and does not depend on the liver for its destruction, is preferred. The dosage is 5 or 10 grains (0.3 or 0.6 gm.) every four hours as necessary. The frequency with which some degree of liver damage accompanies delirium is another reason for not giving the short-acting barbiturates, which are detoxified in the liver. Alcoholics are prone to enjoy the euphoria produced by short-acting barbiturates, and the danger of habituation must be considered. Any of the short-acting barbiturates are contraindicated as a means of relieving tension or insomnia over a prolonged period in alcoholics.

Chapman [1a] concluded that adequate doses of paraldehyde are effective, but that an insufficient amount is more likely to aggravate than to remove the patient's restlessness. He recommends an initial dose of 16 cc. orally followed by 8 to 12 cc. orally every hour as necessary to control the delirium. As much as 10 cc. can be given safely intramuscularly. Burstein cautions as to the use of an excessive dosage of paraldehyde and reports dilatation of the right heart, pulmonary hemorrhage, and edema as the cause of death in reported fatalities from its use. Continuous tub baths are less frequently recommended than previously, partially because the necessary personnel are not generally available and the delirium can usually be controlled medically.

Chloral hydrate is well tolerated either alone or in combination with other sedatives. It produces a "physiological" sleep with a minimal amount of "hangover." Some patients do complain of irritation of the conjunctivas, but this complaint is a subjective one and no demonstrable conjunctivitis is produced. It is contraindicated in advanced liver and renal disease. The dosage in delirium tremens is 2 gm. initially and 1 gm. every three hours as necessary for the first 24 hours. Higher dosages have been used without untoward effects but are not routinely necessary.

Adrenal cortex extract and corticotropin (ACTH) have been advocated by Smith,[8] and Tintera and Lovell.[9] These authors base this recommendation on the similarity between delirium tremens and adrenal cortical hypofunction (Addison's disease). Smith found that corticotropin was more effective than adrenal cortex extract in the treatment of delirium tremens. Tintera and Lovell recommend 30 cc. of adrenal cortex extract intravenously in three doses during the first 24 hours and 2 to 5 cc. weekly following discharge from the hospital as a means of treatment of chronic alcoholism. A recent report [10] on the use of adrenal cortex extract was less optimistic regarding its therapeutic effectiveness. It is of interest that Webster reported improvement in the mental and physical status of alcoholics given adrenal cortex extract, but in his series, the adrenal cortex extract was given for severe liver disease from several causes including alcoholism.

CONCLUSIONS

From the literature only one factor is common to the various methods of treatment of delirium tremens; that is, regardless of the method previously employed, when a physician becomes interested in the syndrome, his results are approximately 50% better, as measured by morbidity and mortality, than the results obtained in the patients selected for a control series. Piker's excellent work [11] showed that regardless of the presence of hydration or dehydration, spinal drainage or no spinal drainage, and use of digitalis or no use of digitalis, neither the morbidity nor mortality in delirium tremens was significantly affected. Therefore it would seem that, regardless of the approach used, the results of treatment will be enhanced if the patient is closely observed during his state of delirium and if he receives adequate care for his systemic difficulties.

It is advocated that the usually evident systemic dehydration be relieved by the administration of sufficient fluid either orally or parenterally and that the patient's hypochloremia be alleviated by giving sodium chloride. The liver glycogen as a rule is depleted; therefore glucose is needed and alcohol is contraindicated. An adequate dietary intake supplemented by a sufficient amount of vitamins to cover the daily requirement and the deficiency that has occurred as a result of the preceding alcoholic bout should be provided. Restraint should be avoided if possible. The delirium is best controlled by paraldehyde, chloral hydrate, and the long-acting barbiturates in that order of preference. Adrenal cortex extract or corticotropin may be included if the patient has cirrhosis or fails to respond to the routine described.

The following outline of treatment is suggested for uncomplicated delirium tremens or for the delirious states that develop in alcoholics postoperatively, during a systemic illness, or following trauma. 1. To 1,000 cc. of

8. Smith, J. J.: Medical Approach to Problem Drinking: Preliminary Report, Quart. J. Stud. Alcohol **10**: 251-257 (Sept.) 1949.
9. Tintera, J. W., and Lovell, H. W.: Endocrine Treatment of Alcoholism, Geriatrics **4**: 274-280 (Sept.-Oct.) 1949.
10. Smith, J. A.: Treatment in Alcoholism, Am. J. Psychiat. **109**: 279-282 (Oct.) 1952.
11. Piker, P.: Clinical Evaluation of Use of Fluids in Treatment of Delirium Tremens, Arch. Neurol. & Psychiat. **39**: 62-69 (Jan.) 1938.

5% glucose in isotonic sodium chloride solution should be added 500 mg. of ascorbic acid, 200 mg. of thiamine, and 100 mg. of nicotinic acid or some vitamin preparation containing an equivalent amount of vitamins. This solution should be given twice in the first 12 hours; if there is evidence of cardiac embarrassment, the diluent for the second infusion should be water rather than isotonic sodium chloride solution. 2. Paraldehyde should be administered, with 10 to 16 cc. orally as an initial dose, depending on the degree of delirium, followed by 8 to 12 cc. orally each hour as necessary to control the delirium; this is usually accomplished by the fourth or fifth hour. 3. Chloral hydrate, 2 gm. initially and 1 or 2 gm. every three hours may be substituted if the patient refuses to take paraldehyde. 4. Mephobarbital (mebaral®) 6 grains (0.4 gm.) initially and 3 grains (0.2 gm.) four times a day, should be given to supplement the other sedatives; after 48 hours, the mephobarbital alone should suffice for sedation.

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SUBDURAL FLUID COMPLICATING BACTERIAL MENINGITIS

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and
Donald D. Matson, M.D., Boston

The purpose of this report is to draw attention to the frequent occurrence of a complication of bacterial meningitis that we believe may be a significant cause of residual brain damage if it is not recognized and treated early. A preliminary report [1] has already been published elsewhere. Subsequently Smith, Dormont, and Prather [2] reported a series of 20 patients with the same complication of meningitis, Meneghello and Aguilo [3] noted seven cases in Chile, and Arnold [4] recently described five similar cases. As early as 1916, A. B. Schwartz [5] specifically suggested meningitis as one cause of chronic subdural hematoma of infancy. Since that time a number of similar case reports [6] have appeared, but the high incidence of significant amounts of subdural fluid complicating bacterial meningitis in infants has not been generally recognized. This condition appears to be separate from secondarily infected subdural hemorrhage after head injury and from acute subdural bleeding as a hemorrhagic complication of meningococcic meningitis.

Because a review of clinical records of patients with meningitis revealed a number in whom a diagnosis of subdural hematoma had been made during the course of their disease, a systematic program of performing subdural taps or burr holes on patients with an unsatisfactory clinical course was instituted late in 1948. The present report includes data gathered in this fashion over the subsequent three year period at the Children's Medical Center and at the Mary Fletcher Hospital. A few of the patients were initially treated for their meningitis at other institutions and then transferred to one of these two hospitals because of an unsatisfactory clinical course.

The indications used for performance of subdural taps were (1) failure of the temperature curve to show a progressive decline, particularly after 72 hours of adequate treatment; (2) positive cerebrospinal fluid culture after 48 hours of adequate treatment; (3) convulsions during the convalescent period; (4) focal convulsions at any time; (5) vomiting during convalescent period; (6) gross neurological abnormality; (7) clinical impression that the course was unsatisfactory.

Thirty-seven of the 50 patients were studied during the three year period. The only death in this group was in a patient with tuberculous meningitis and could not be attributed to his subdural fluid collection or its management. Among the 13 cases diagnosed prior to the start of the systematic investigation there were 3 deaths. One occurred during craniotomy at another hospital. The other two occurred as the end-result of severe cerebral damage one and four years after the disease, respectively. The nine patients of the preliminary report [1] are included among the 37 studied systematically. Two were treated elsewhere, but full details were made available to us in consultation.[7] In addition to the 50 patients listed, in all of whom the diagnosis was made during life, a review of the autopsy records of the Children's Hospital between 1920 and 1946 revealed 25 more patients with meningitis in whom significant amounts of fluid were discovered in the subdural space at postmortem examination (table 1).

The fluid obtained at initial tap of the subdural spaces of the 50 patients diagnosed during life was, in most instances, xanthochromic and contained a small number of red blood cells on microscopic examination; however,

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From the departments of pediatrics and surgery, Harvard Medical School, and the departments of medicine and neurosurgery, Children's Medical Center, Boston (Drs. Ingraham and Matson); and the Division of Pediatrics, University of Vermont College of Medicine, and the Department of Pediatrics, Mary Fletcher Hospital, Burlington, Vt. (Dr. McKay). Dr. McKay is a Scholar in Medical Science, John and Mary R. Markle Foundation.

1. McKay, R. J., Jr.; Morissette, R. A.; Ingraham, F. D., and Matson, D. D.: Collections of Subdural Fluid Complicating Meningitis Due to Haemophilus Influenzae (Type B): A Preliminary Report, New England J. Med. **242**: 20 (Jan. 5) 1950.

2. Smith, M. H. D.; Dormont, R. E., and Prather, G. W.: Subdural Effusions Complicating Bacterial Meningitis, Pediatrics **7**: 34 (Jan.) 1951.

3. Meneghello, J., and Aguilo, C.: Derrame Subdural y Meningitis Aguda Purulenta, Rev. chilena de pediat. **22**: 91 (March) 1951.

4. Arnold, G. G.: (*a*) Purulent and Serous Subdural Effusions in the Course of Purulent Meningitis, J. Pediat. **39**: 191 (Aug.) 1951; (*b*) The Nature of Postmeningitic Subdural Effusions, ibid. **40**: 757 (June) 1952.

5. Schwartz, A. B.: The Etiology of Pachymeningitis Hemorrhagica Interna in Infants, Am. J. Dis. Child. **11**: 23 (Jan. 16) 1916.

6. Rosenberg, O.: Die Pachymeningitis haemorrhagica interna im Kindesalter, Ergebn. d. inn. Med. u. Kinderh. **20**: 549, 1921. Adams, R. D.; Kubik, C. S., and Bonner, F. J.: The Clinical and Pathological Aspects of Influenzal Meningitis, Arch. Pediat. **65**: 354 (July) 1948; **65**: 408 (Aug.) 1948. Riley, H. D., Jr.: Pneumococcal Meningitis with Hyperglycemia and Development of Subdural Effusion: Successful Treatment with Chloramphenicol, J. Pediat. **37**: 909 (Dec.) 1950. Steinberg, S. H., and Murphy, J. P.: Subdural Hygroma Complicating Meningococcic Meningitis, J. Neurosurg. **8**: 671 (Nov.) 1951.

7. Dr. Maurice N. Kay, Providence, R. I., and Dr. Allen M. Hill, Beverly, Mass., provided information concerning these two patients.

fluids ranging from crystal clear to grossly bloody were found. The character of the fluid varied in the same patient from tap to tap, usually showing a progressive increase in red blood cell and total protein content during

TABLE 1.—*Patients with Meningitis in Whom Excessive Amounts of Subdural Fluid Were Found at Autopsy, at Children's Hospital, 1920-1946*

Type of Meningitis	No. of Autopsies	No. of Cases with Large Amounts of Subdural Fluid
Hemophilus influenzae	104	14
Pneumococcic	85	8
Meningococcic	29	3
Total	218	25

the first few days of tapping followed by a progressive decrease. Microscopically, white blood cells in concentrations of 200 to 300 per counting chamber field were often found even in the absence of infection. The total protein concentration of the fluid obtained ranged between 0.5 and 3.5 gm. per 100 cc. in most cases. One collection of relatively clear fluid had a protein content of only 60 mg. per 100 cc., however. In all instances, fluid from spinal punctures done at the time of the initial positive subdural tap had a significantly lower protein

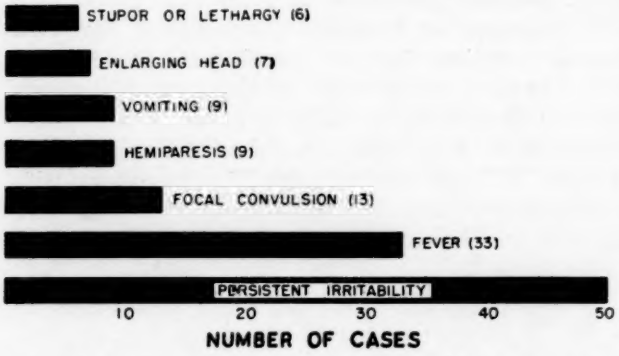

Fig. 1.—Incidence of major symptoms in 50 patients with subdural fluid complicating bacterial meningitis.

content. The fluid was frequently obtained on one side only at the first tap but was later found on both sides. It was infected with the causative organism of the concurrent meningitis in 8 of the 50 patients. The amount of fluid obtained at any single subdural tap ranged from 1.5 to 20 cc. but in most cases was 7 to 15 cc. Subdural taps were repeated daily for 7 to 10 days or until the fluid disappeared. No more than 15 to 20 cc. was allowed to drip slowly from the needle at any one tap because of the possible risk attendant on marked changes in intracranial pressure relationships that might be produced by sudden removal of larger amounts of fluid. Undesirable symptoms (fig. 1) were relieved almost immediately by repeated release of subdural fluid. It is emphasized that in addition to more specific symptoms almost all the patients appeared more subdued than normal, seemed more irritable than warranted by the stage of the disease, were anorexic, and appeared to those in attendance to be doing less well than they should.

Exploratory burr holes, followed by craniotomy and wide surgical excision of subdural membranes when found, were performed on 42 patients. Five patients had no surgical exploration. It is of interest that the only one of these five who was over 1 year of age is also the only one of them considered to be mentally normal at the present time. The data presented in figure 2, which illustrate the relatively high incidence of membrane formation in infants under 1 year of age, suggest the possibility

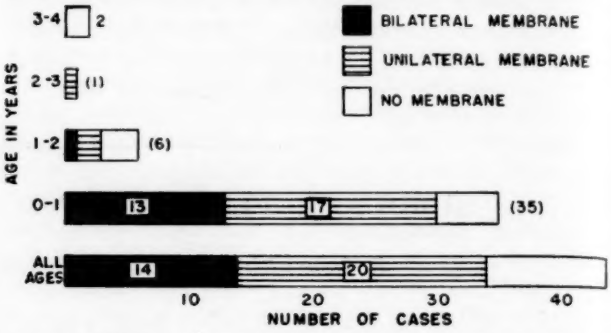

Fig. 2.—Incidence of membrane formation in 44 patients with subdural fluid complicating bacterial meningitis who were explored surgically.

that the high incidence of cerebral defect in these four patients was due to failure to remove a subdural membrane. In two patients who had barely perceptible membrane formation, the membranes were not removed. Both appear to be mentally normal on one year follow-up. In one patient who had diagnostic burr holes at another hospital without any membranes being found, the postoperative course suggested the subsequent development of subdural membranes, but the patient was not reexplored. This patient is not included in figure 2.

In contrast to the incidence among the cases diagnosed during life, only 2 of the 25 cases from the autopsy records showed membrane formation, and one occurred in an infant with typical history and symptoms of subdural hematoma present long before onset of meningo-

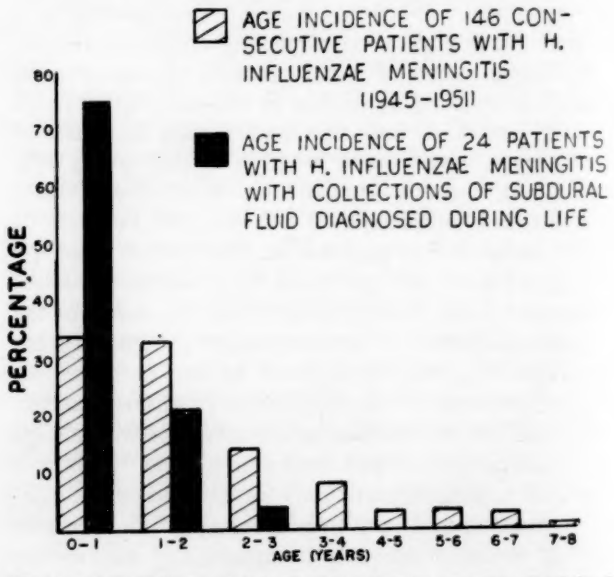

Fig. 3.—Age incidence of patients with excessive amounts of subdural fluid diagnosed during life compared with that of all patients with Hemophilus influenzae meningitis.

coccic meningitis. The low incidence of membrane formation among the autopsied patients, most of whom were treated prior to the era of effective chemotherapy, suggests that it may be related to the length of time fluid

is present in the subdural space. One patient of those diagnosed during life showed no membrane when burr holes were done; however, he continued to produce subdural fluid in large amounts, and when he was re-explored three weeks later a membrane was found. The thickness of the membranes appeared to be unrelated to the amount or character of subdural fluid formed. Microscopic examination of all membranes removed showed in every instance fibrous granulation tissue with hemosiderin deposits typical of the membrane of subdural hematoma.

Figure 3 portrays the age incidence of patients having subdural fluid formation with Hemophilus influenzae meningitis as compared with the age distribution of all patients with the same type of meningitis over the same period. The relatively higher proportion of infants under 1 year of age among the patients with subdural fluid formation strongly suggests that age itself is a factor of major importance in the development of subdural fluid collections as a complication of meningitis.

Figure 4 illustrates what is believed to be a true picture of the incidence of subdural fluid formation in patients with meningitis, since the data were obtained during a period when subdural taps were being performed according to the indications already listed. Although no fluid was obtained from a number of children in whom subdural taps were done according to the same indications, this number was surprisingly small as is shown in figure 4. It should be noted that in 60% of all patients under 1 year of age who were treated for H. influenzae, meningococcic, or pneumococcic meningitis during the three year period of study collections of subdural fluid developed.

ETIOLOGY

The data presented in figures 3, 4, and 5 suggest that age of the patient and type of infecting organism are of importance in the etiology of subdural fluid collections complicating bacterial meningitis. Analysis of our clinical

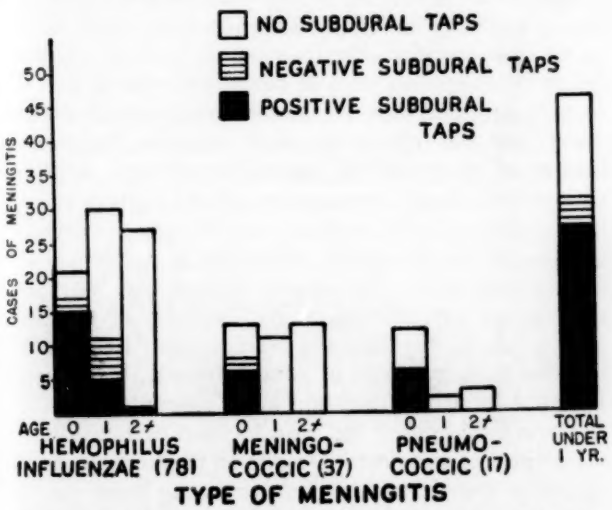

Fig. 4.—Incidence of subdural fluid complicating acute bacterial meningitis during a three year period (1948-1951).

material appeared to eliminate all but the first of the following six more basic possible etiological factors: (1) effusion of fluid through irritated or damaged capillary walls in the arachnoid or the dura mater; (2) osmosis into liquefied purulent exudate in the subdural space; (3) gross hemorrhage into the subdural space; (4) preexisting chronic subdural hematoma; (5) trauma from diagnostic and therapeutic procedures; (6) influence of various forms of chemotherapy, including intrathecal administration of antibiotics. On the positive

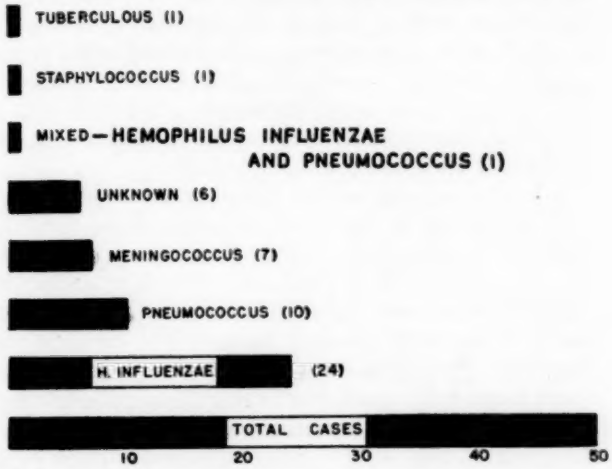

Fig. 5.—Causative organism in 50 patients with subdural fluid complicating bacterial meningitis.

side, Smith, Dormont, and Prather [2] have emphasized the analogy to pleural effusions, many of them sterile, which may complicate bacterial pneumonia, and have postulated that the frequency with which subdural fluid is bloody in contrast to pleural fluid may be due to damage by stretching of the "bridging veins" that cross the subdural space. Gitlin [8] has analyzed the proteins of subdural fluid from nine patients recovering from bacterial meningitis. He found that the albumin-gamma globulin ratios and the albumin-total protein ratios in these fluids were considerably higher than the same ratios in corresponding blood serum samples removed at the same time from the same patients. He has postulated that these findings suggest that the basic mechanism of fluid accumulation in the subdural space in these patients is an effusion through irritated or damaged capillary walls in the arachnoid or in the dura itself. Arnold [4b] has presented other biochemical evidence that has led him to a similar hypothesis.

SURGICAL TREATMENT

The treatment of subdural fluid accumulations complicating bacterial meningitis is essentially the same as that described elsewhere for traumatic subdural hematoma in infancy.[9] The first diagnostic tap begins treatment, and the infant may start to improve immediately. If started early, repeated taps may dry up the effusion in a few days and no further treatment be indicated. In more chronic or persistent accumulations, however, the fluid usually becomes encapsulated between an outer and an inner fibrous membrane. In infancy, particularly in the first year of life, it is necessary to remove these membranes by craniotomy to prevent reaccumulation of

8. Gitlin, D.: A Study of the Pathogenesis of Subdural Collections of Fluid, read before Society for Pediatric Research, Old Point Comfort, Va., May 5-7, 1952.

9. Ingraham, F. D., and Matson, D. D.: Subdural Hematoma in Infancy, J. Pediat. 24: 1 (Jan.) 1944.

the fluid and to permit normal reexpansion and growth of the brain.

In all patients, therefore, who repeatedly yield large amounts of subdural fluid on tapping after meningitis, a craniotomy is planned under general anesthesia. The incision is outlined, and the superior frontal burr hole of the proposed bone flap is drilled. If this demonstrates that a membrane is present, the craniotomy is carried out; if there is no membrane, the subdural space is irrigated thoroughly through one or more burr holes and the same procedure is then repeated on the other side at the same operation. If craniotomy is performed, the second side is explored in 7 to 10 days.

It is wise to delay surgery and continue subdural taps until the patient is fever-free, cultures of the subdural fluid and lumbar cerebrospinal fluid are negative, and the cell counts of these fluids are reduced to below 100 white blood cells per cubic millimeter. Antibiotic therapy should be continued through the period of subdural tapping and operative treatment. At operation the membrane is apt to be much more ragged and adherent than that seen in subdural hematoma. Collections of fibrin in the subdural and subarachnoid spaces are often seen. After operation these patients should be kept on anticonvulsant therapy for at least the first two weeks even if there have been no preoperative seizures. When this has not been done, a high percentage have had one or more generalized seizures in our experience.

SIGNIFICANCE

Although the data presented appear to prove conclusively the frequent occurrence of collections of subdural fluid of high protein content complicating meningitis, the relationship of this complication to the prognosis for the individual patient is more difficult to evaluate. In our opinion the presence of significant amounts of fluid in the subdural space over periods longer than a few days may result in permanent brain damage. We also believe that the presence of an organized subdural membrane in small infants will interfere with the normal growth of the brain.[9] The age incidence of patients with meningitis who have subdural fluid formation corresponds extremely well with the age group having the highest incidence of cerebral damage. That is, the frequency of both is significantly greater in patients under 1 year of age. A review of 75 consecutive case records of patients with influenzal meningitis seen at the Children's Medical Center during the three years from September, 1945, to November, 1948, showed 18 patients left with gross neurological or mental residuals of their disease. Of these, all but two would have had early subdural taps by the criteria listed at the beginning of this paper and now practiced. We believe it to be significant that, since the frequency of subdural fluid accumulations in patients with meningitis has been recognized, hemiplegia as one of the sequelae of meningitis has become virtually nonexistent in the hospitals with which we are connected.

10. The psychological data described in this paper were collected by the Psychological Service of the Children's Medical Center and are part of an extensive follow-up study on children recovered from meningitis, conducted by Dr. John A. V. Davies, Dr. Edith Meyer, and Mrs. Harriet Hyde Sands, to be published.

Follow-up examinations were performed by experienced psychologists on all patients whose follow-up period extended one year or more after the disease and in most of the others.[10] All patients were classified as competitive (normal range for their heredity and environment), competitive with concessions (behavior disorders or intellectual ability less than that expected from heredity, environment, and previous performance), or noncompetitive (unable to assert themselves normally in their environment). The last classification included all patients with an intelligence quotient of 80 or less. These criteria were used to compare the group of patients in whom subdural fluid accumulations complicating meningitis were discovered before they were systematically looked for and treated with the group in which the condition was purposefully looked for and therefore recognized and treated early. Only children with a follow-up at least one year after discharge were considered, because of the uncertainty of the results of psychological examination within a few months after meningitis has occurred in infants. The data thus obtained are presented in table 2. Although we believe

TABLE 2.—*Comparison of Patients Whose Subdural Fluid Accumulations Were Discovered Before and During Investigation*

Psychological Classification	Prior to Systematic Investigation, No. of Patients	Subsequent to Start of Systematic Investigation, No. of Patients
Competitive	1	16
Competitive with concessions	3	4
Noncompetitive	8	2
Total patients	12	22

these figures are significant, the discrepancies noted between the two groups of patients must be considered only tentative until a longer follow-up period is available on the children whose subdural fluid accumulations were recognized and treated promptly.

Special consideration of two patients not included in the figures of table 2 is worth while. One was first seen by us three months after his meningitis, which was followed by symptoms that, in our hands, would have led to early subdural taps. At the time his encapsulated subdural fluid and membranes were removed, there was a history of progressively increasing cerebral deterioration, which, though apparently arrested by surgery, was irreversible and left the infant with severe and probably permanent brain damage. Attempts at follow-up have been unsuccessful. The second patient had burr holes done at another hospital on the 24th day of his illness after subdural taps done the preceding day had revealed bilateral accumulations of xanthochromic, blood-tinged subdural fluid. At operation large amounts of xanthochromic fluid gushed forth on incision of the dura but no membrane was noted. Despite an unsatisfactory postoperative course, including an enlarging head, no subsequent subdural taps or surgery were performed. Thirteen months later, when the patient was admitted to the Children's Medical Center, permanent severe cerebral damage was present, in contrast to a third patient handled from the start by us, who had had a similar initial course, but in whom subdural taps were continued during an unsatisfactory course after diagnostic

burr holes. These were repeated on this patient three weeks later, at which time subdural membranes were identified and subsequently removed with an uneventful postoperative course. Had the first two of these three patients been included in the group in which the condition was not being actively searched for, the figures of table 2 would have been even more heavily weighted to show that early recognition and proper treatment of subdural fluid accumulations complicating bacterial meningitis will result in a significant alteration for the better of the prognosis for normal cerebral function.

SUMMARY AND CONCLUSIONS

Fifty children with accumulations of subdural fluid of high protein content complicating bacterial meningitis are reported. The age incidence and characteristics of the condition appear to be identical with those of chronic subdural hematoma of infants. This study suggests that over half of patients under 1 year of age now treated for acute bacterial meningitis have a clinical course complicated by collections of subdural fluid, the majority of which are membrane-encapsulated.

Removal of the fluid by repeated subdural taps results in remission of symptoms. Repeated drainage of the fluid by means of subdural taps, followed by exploratory burr holes and by craniotomy with wide excision of subdural membranes where present, is advocated as the treatment of choice.

There is a probable causal relationship of such fluid collections to the incidence of permanent neurological damage after meningitis. Follow-up psychological and physical evaluation suggests emphatically that early recognition and treatment of patients with this condition reduces the incidence of neurological damage following meningitis, although lack of standardized treatment of meningitis or long-term psychological follow-up on recent patients make this impossible to prove at this time.

300 Longwood Ave. (15) (Dr. Ingraham).

TRANSVESTISM

HORMONAL, PSYCHIATRIC, AND SURGICAL TREATMENT

Christian Hamburger, M.D., Copenhagen, Georg K. Stürup, M.D., Herstedvester
and
E. Dahl-Iversen, M.D., Copenhagen, Denmark

Transvestism has been defined as the desire to appear in the clothes of the sex to which the person in question, according to his or her external genitalia, does not belong. The word is derived from *trans:* opposite, and *vestitus:* dress, and was coined by the German sexologist Magnus Hirschfeld.[1] In the English-speaking countries the term eonism is sometimes applied. As with "sadism" and "masochism," it is derived from the name of an actual person; in this case a French diplomat, Chevalier d'Eon (born 1728, in Bourgogne, died 1810, in London). There have been a number of reports on transvestism.[2]

Transvestism, in the widest sense of the term, must be regarded as a symptom that may appear in a number of conditions, and only by thorough clinical analysis is it possible to distinguish between these various states. There are fetishists who, as a consequence of neurotic obsession, concentrate on one or more articles of dress, thereby developing an interest in partial or complete cross dressing. Not infrequently, homosexual men of the passive type develop a desire to wear jewelry, to use perfumes, and to dress in feminine clothes. In both these categories the transvestic urge is sexually caused to a pronounced degree and is usually of secondary importance only. A further investigation of such cases of transvestism will be published in a separate report.[3] Transvestism in women will not be dealt with in the present report. There remains, then, the category of transvestic men in whom the desire is so dominant as to justify the designation "genuine transvestism" or "psychic hermaphrodism"; there may be reason to reserve the term eonism for this group. On the basis of the literature, our own observations, and personal letters, the present report sets out to outline the characteristic features of eonism (or genuine transvestism).

SYMPTOMS

Eonists are persons with a fundamental feeling of being victims of a cruel mistake—a consequence of the female personality in a male body. They experience an extremely pronounced desire to wear women's clothes; this, however, must be understood as only one of the many means through which the person attempts to identify himself with the female sex, to be regarded as a woman by society, to be called by a woman's name, and to occupy himself with womanly tasks. Men's clothes are felt to be an intolerable disguise and manly occupations a severe burden. The person conceives it to be against his nature to have to live and act as a man, with never a possibility of being able to follow the spontaneous inclinations of his own "self"; this entails a continual mental stress that may lead to more or less intense neurotic conflicts and

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Read in part before a joint meeting of the Danish Society for Endocrinology, the Danish Surgical Society, and the Danish Psychiatric Society, at the University Hospital, Copenhagen, Feb. 13, 1953.

From Statens Seruminstitut, Hormone Department (Dr. Hamburger), the Institution for Psychopaths (Chief Physician, Dr. Stürup), and the Surgical Clinic C, University of Copenhagen (Professor Dahl-Iversen).

1. Hirschfeld, M.: Sexualpathologie, in Der Transvestitismus, Bonn, A. Marcus & Weber, 1918, chapter 3, p. 139.

2. (*a*) Cawadias, A. P.: Hermaphroditos: The Human Intersex, London, William Heinemann, Ltd., 1943. (*b*) Deleted on proof. (*c*) Ellis, H.: Studies in Psychology of Sex, Philadelphia, F. A. Davis Company, 1928, vol. 7. (*d*) Forel, A.: Die sexuelle Frage, München, E. Reinhardt, 1909, vol. 12. (*e*) Hirschfeld, M.: Geschlechtskunde auf Grund dreissigjähriger Forschung und Erfahrung, Stuttgart, Püttmann, 1926, vol. 1, p. 585. (*f*) London, L. S., and Caprio, F. S.: Sexual Deviations, Washington, D. C., Linacre Press, 1950. (*g*) Hirschfeld.[1]

3. Stürup, G. K.: To be published.

possibly to suicidal attempts. When male transvestites wear feminine clothes and appear as women, they experience mental relaxation, balance, and inspiration, and the enjoyment of life.

The wearing of women's clothes in these cases does not aim at, and does not involve, any sexual satisfaction, and it is a characteristic feature that the dress is respectable and in no way provocative. On the whole, the sexual life generally plays but a minor part. Attraction to normal, heterosexual men is no infrequent phenomenon, but the genuine transvestite is disgusted by relationship with homosexual men. Attraction toward the female sex is generally on a higher plane, but only rarely, and possibly never, is such attraction of a direct erotic nature. The dominant feature is the urge toward attaining the "ideal of perfection," and here is the cause of marriages in these cases, possibly in many instances coupled with the hope of suppressing the transvestic tendencies through a normal married life. Most marriages between normal women and transvestites will grow disharmonious and be dissolved, but it is no rare occurrence for the wife to accept the tendencies in her husband. If children are born of the marriage, the husband frequently will feel deep attachment and love toward them. Married sexual intercourse is generally rare, and the husband considers himself the passive partner. The feeling of "being in reality a woman" will often lead to dislike of, disgust of, or veritable hatred against the person's own sexual organs, with the logically consequent wish for castration or demasculinization. Attempts at self-castration are by no means rare.

DEVELOPMENT AND COURSE

Eonism may, in most cases, be traced back to early childhood: an intense wish to be a girl; preference for playing with dolls; sympathy, mixed with envy, toward girls; and the satisfaction of wearing girls' clothes. The years of puberty bring no change, beyond the consciousness of the abnormal state. The young man will become separated from his friends, feeling rootless, divided, and lonely. The lack of understanding he encounters will cause isolation from his fellow men; he will disguise his tendencies and take up the futile battle to conquer them. Hereafter, the feeling of being a woman who has to act as a man will be the all-dominant factor in the patient's life. In his earlier adult years he may try to overcome his tendency through hard masculine work, through normal intercourse, and possibly through marriage. A certain, but definitely limited, number will try—but in vain—to enlist medical assistance. The urge will be unconquerable, and the fight against it will have to be abandoned. Some patients become resigned and satisfy their transvestic tendencies in loneliness, hidden from everyone else, and it is an obvious supposition that many genuine transvestites have gone to their graves without anyone suspecting their abnormality. Others take up the fight against society: they wish to persuade the community to acknowledge their right to live as women. It is impossible to say with any degree of certainty to what advanced age the tendencies persist; but we have proof that the problem is alive in men almost aged 60. They are willing to sacrifice anything to live a short term of years as women, even as "elderly women."

CAUSES

It cannot be denied that eonism may be psychically conditioned. But a number of sexologists and psychiatrists who know these patients and classify them as distinct from homosexuals with transvestic tendencies consider it likely that the affection is constitutionally conditioned (Hirschfeld [1,2e]). So far as we know, no psychiatrist or psychoanalyst has succeeded in tracing a satisfactory explanation of the cause of the affection. It is probable that physical factors may play a decisive role, as evidenced by the frequent appearance of more or less pronounced feminine physical appearance. On the other hand, there are eonists having completely normal masculine habitus. It is reasonable to suppose that the more feminine the physical features in a man the more likely are the chances of sexual difficulties (impotence, homosexual tendencies, and possibly transvestic tendencies). Determinations of the urinary excretions of hormonal substances will probably be of little value for the demonstration of endocrine disturbances as causal factors in transvestism. This can be no matter for wonder when one considers that assays of the urinary metabolites of the gonadal and adrenocortical hormones (e. g., estrogenic and androgenic substances and 17-ketosteroids) do not permit of determining, with any certainty, whether a specimen of urine originates from a normal man or a normal woman.

The eonist's feeling of being a woman is so deeply rooted and irresistible that it is tempting to seek deeper somatic causes of the disease. We have considered the possibility that some of the most pronounced transvestites might be intersexes (sex intergrades) of the highest degree, i. e., *Umwandlungsmänner,* according to Goldschmidt's intersex theory. It must be considered an established fact that women are homogametic and men heterogametic and also that the sex chromosomes are not the sole sex determining factors. According to Goldschmidt,[4] all, or at any rate the majority, of human intersexes should be gametically female, i. e., possess two x-chromosomes in their body cells. The degree of intersexuality was thought to depend on the time at which the disturbance of the sex determination occurs (*Drehpunkt*). By *Drehpunkt* at a very early stage in the fetal development, the gonads are supposed to develop as testes, and the secondary sex organs will be male. The male organs in these persons, who according to their chromosomes are women, must be regarded as malformations. The possibility of the existence of human *Umwandlungsmänner* can by no means be disregarded. Future investigations into the genetics and chromosome distribution in transvestites will decide the possible validity of this working theory.

TREATMENT

As far as is known, all attempts at treating genuine cases of transvestism have been futile, provided treatment is taken to mean attempts at curing the affection. It is acknowledged that psychotherapy does not lead to the desired end; in practice it is impossible to make a

4. Goldschmidt, R.: Die sexuellen Zwischenstufen, in Gildemeister, M., and others: Monographten aus den Gesamtgebiet der Physiologie der Pflanzen und der Tiere, Berlin, Julius Springer, 1931.

genuine transvestite wish to have his mentality altered by means of psychotherapy, thereby bringing it into harmony with his physical appearance. Experience concerning the effect of treatment with male sex hormones (testosterone) is limited. In the cases in which such treatment has been administered, the effects have not been up to expectations. Many patients, however, categorically refuse such attempts; they have no wish to be "cured" of their transvestism; they feel it is in agreement with their "true selves" and wish only to be deprived of the detested masculine component. Thus they regard attempts at increasing the maleness as breaches of the laws of nature.

The object of the medical profession, therefore, is to bring about — as extensively as possible — conditions that may contribute toward the patient's mental balance and a certain sense of "purpose of life." A number of patients are able to handle these problems by themselves, by occasionally putting on women's clothes when they are alone. Others feel the necessity, now and again, of wearing women's clothes in public. In certain countries the authorities may permit such conduct, provided a medical certificate can be obtained to the effect that such conduct is necessary in view of the mental condition of the patient. A great proportion of Hirschfeld's patients had such facilities.[1] In Denmark and Sweden similar permissions have been granted in recent years, in extremely rare cases. Two British patients have informed us that the authorities in question have shown understanding to the degree of having "legally registered" the patients as women despite the presence of normal male genitals.

In patients with a deeply rooted aversion against their own genitals, the possibilities of treatment are considerably limited by the legislation governing castration in each country. As a rule, castration will have to be sanctioned by the authorities unless pathological processes in the sexual glands necessitate the operation. In certain countries, e. g., Denmark, Norway, and Sweden, the law makes voluntary castration possible when the patient's sexuality makes him prone to commit crimes, thereby making him a danger to society, or when it involves mental disturbances to a considerable degree, or social deterioration.[5] These legislative measures make it possible to remove in transvestites those organs the presence of which seriously impair their mental health. Surgicoplastic measures in respect of the genitals of castrated persons (including amputation of the penis) have not been foreseen by the law.

FREQUENCY AND OCCURRENCE

Genuine transvestism is certainly an exceedingly rare affection, although it may occur more frequently than generally supposed. It will hardly be possible to state exact figures. The affection seems to occur in all races and on all levels of society, even among ethically, culturally, and socially highly developed persons. We are in personal contact with five Danish transvestites in a population of nearly 4 million inhabitants.

REPORT OF A CASE

The patient, a man aged 24, approached us in August, 1950, and was subjected to treatment until December, 1952. He was the younger of two children in the family. His sister was some years older, and he had never felt any deep affection for her. The parents were healthy and there is no information of the patient having any exceptional feelings toward them. As a child he was very quiet and reserved, and he had but few friends. As long as he could remember he had had a very strong desire to be a girl, and he had to fight his urge to play with girls' toys. He was highly interested in girls' clothes, and himself wanted to be dressed as a girl. He found it difficult to join in with other boys. The years of puberty did not change his feeling of being "different" from other boys, but he was unable to take anyone into his confidence, and during the following years he figuratively set up a wall around himself to conceal the knowledge of his peculiarity from those around him. His school achievements were average, but he felt that he would have done better had he been able to concentrate—and without the feeling of isolation. He had to continually occupy himself with new things in order to avoid thinking of himself.

It became more and more evident to him that he would never be able to fit into society as a man; he felt himself to be a woman, and he could not escape the idea that "nature had made a mistake" in giving him the appearance of a man. Later he yielded to his pronounced transvestic tendencies. He acquired a complete set of women's clothes and secretly put them on. This relieved the psychic pressure he invariably felt when in men's clothes.

He would in no circumstance enter into any homosexual relationship; this not for lack of opportunities. On the whole, his sexual libido appears to have been but slight. He felt a pronounced distaste toward his own genitals and toward his male physical features. Thus, he had shaved his pubic hair, giving it a female upper delineation. According to his own statement he never showed this to anyone, but he experienced an inner satisfaction in this slight alteration toward femaleness. At all times, however, the patient was concerned with the one problem "man or woman," and his interest in sexual biological problems induced him to seek training in laboratory technique, and he studied the endocrine literature available to him. During this period he consulted a number of physicians, including psychiatrists. However, they viewed with a considerable degree of skepticism the possibilities of helping him by means of psychotherapy, and at all events an exceedingly protracted and immensely expensive treatment was predicted. For a period he administered of his own accord estrogenic substances orally, the doses being, however, too small to produce any marked effect.

The patient approached us (August, 1950) and explained his case history. Evidently he was severely depressed and felt it impossible to continue life as a man. We thought his mention of possible suicide was sincere. Primarily he wanted, by castration, to be relieved of the essential source of the detested masculine component of his body; further, he hoped with medical assistance to be able to obtain permission to live on "as nearly a woman as possible."

Physical Examination.—The patient was 170 cm. tall. The width of his chest was 78 cm., and the width of his abdomen 70 cm. His legs (trochanter to floor) were 88 cm. long, and his arms (acromion to the tip of the third finger) were 74 cm. long. He weighed 55 kg. He was of the asthenic type with a feminine habitus. There were fairly pronounced fat deposits in the hip region. There was pigmentation of the nipples and a slight increase of the mammary parenchyma (possibly artificially induced by previous administration of estrogens), but no gynecomastia proper. Hair on the arms and legs was sparse. The upper edge of the pubic hair was of feminine configuration; this was stated by the patient to have been artificially produced. There was medium muscle strength. The voice was natural. The nonerected penis was 9 cm. long, and the testes were somewhat under average size but of normal consistency. Rectal exploration revealed normal size, consistency, and surface of the prostate. Examination of sperm and biopsy of the testes was not carried out. The blood pressure was 120/75 mm. Hg.

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5. Danish Sterilization and Castration Act, No. 176, May 11, 1935; cf. Danish Sterilization Act, No. 130, June 1, 1929. In Holland and in certain parts of Switzerland this operation is also possible.

Personality.—The patient was intellectually extremely gifted. His mode of expression tended toward sentimentality. He was slightly affectionate, with feminine voice production and movements. The impression he made through his eccentric choice of men's clothing was odd; the colors were too varied for a man, and his clothes were evidently always "in the way." Sexually he was undoubtedly comparatively passive and was obviously embarrassed by having been frequently taken for a homosexual. He was self-reproaching to a considerable degree and probably had a number of well-hidden, unsolved personality problems but no acute neurotic complaints. He did not want a psychotherapeutic solution of the problem, and the desire for it could not be aroused. This was particularly due to his having been previously refused treatment of this kind and partly due to his feeling that it would offend against what he himself felt to be his "true self" to accept such a scheme, which, moreover, would have met with unsurmountable difficulties, if accepted, as there was no suitable therapist and he had no financial resources.

Hormone Analyses.—Two 24-hour urine specimens (Aug. 2 and 10, 1950) were assayed, with the following results:

	1.	2.
Gonadotropic substances	<50 M.U./24 hr.	<50 M.U./24 hr.
Estrogenic substances	<20 M.U./24 hr.	>50 M.U./24 hr.
Androgenic substances	13 I.U. /24 hr.	28 I.U. /24 hr.
17-ketosteroids	15.1 mg./24 hr.	15.4 mg./24 hr.

These figures are normal for a man of the patient's age, with the exception of a rather high estrogen level in specimen no. 2 and a rather low androgen level in specimen no. 1. It must be admitted, however, that the technical variation in these biological assays is so great that the figures do not allow of any definite conclusions.

Treatment.—Our suggestion of treatment with testosterone preparations in an attempt to alter his mentality in a masculine direction was firmly refused. The patient felt it would be of no help, rather the contrary. We clearly pointed out to him that any irrevocable step should be taken only after careful consideration, but on the other hand we did not think we were in the position—despite all difficulties—to decline an attempt at giving the patient medical aid. All possibilities were thoroughly discussed with the patient, and it was decided to provoke hormonal castration by means of estrogenic substances. The administration of estrogenic substances, moreover, served another purpose, i. e., an examination of the effect of estrogens on the adrenocortical function, as reflected in the urinary excretion of 17-ketosteroids and reducing corticoids. An account of the results has been given in a previous publication,[6] and we shall confine ourselves to summarizing the main results here. After the administration of estrogens, the excretion of 17-ketosteroids was reduced to half the amount of pretreatment level, whereas no significant changes in the excretion of corticoids occurred. This observation points to the fact that the production of testis hormone, but not the production of corticosteroids, was inhibited. Furthermore, it was found that the 17-ketosteroids reached pretreatment level in the course of 26 days after discontinuation of the estrogen administration, despite the fact that the period of hormonal castration had lasted four to five months. The inhibition of the testicular function was thus found to be reversible.

In the course of the first 10 months' period of observation the total doses of estrogenic substances were 95 mg. of estradiol monobenzoate, administered in oily solution (three intramuscular injections of 15 mg. each and 10 intramuscular injections of 5 mg. each), and 13.9 mg. of ethinyl estradiol, administered orally. The testicular inactivity could be maintained by as small a daily dose as 0.10 mg. of ethinyl estradiol, taken orally. Simultaneously with the depression of the 17-ketosteroids, marked atrophy of the testes was observed, together with swelling of the breasts. According to the statement of the patient, the sexual libido and erections disappeared during the same period, and this was also true of the mental pressure that he had previously experienced. The patient was now in a state of mental balance, psychically at ease; he was freed from his mental stress and worked with increased vigor and inspiration at his job. On the basis of his state, the patient was able to say during what periods he had low excretion of 17-ketosteroids, before being informed of the analysis reports.

The very thorough continuous psychiatric investigation showed the improvement in the mental state to be stable and genuine. Since the patient adhered to his wish for operative castration, this procedure was preferable to continued estrogen administration. Consequently, an application for permission to castrate was submitted to the Danish Ministry of Justice. After the application had been considered by the Medico-Legal Council, permission to operate was granted. The operation was performed at the Köbenhavns Amtssygehus (Copenhagen County Hospital). The patient was then 26 years old. During a period of four months preceding the castration, no estrogenic substances had been administered. Microscopic examination of the testes showed atrophic tubules but well-preserved interstitial cells.

Postoperatively, the 17-ketosteroid excretion was diminished to the same extent as during estrogen administration, the excretion of reducing corticoids being uninfluenced. As might have been expected, an injection of estradiol monobenzoate (15 mg.) had no effect on the 17-ketosteroids after the operation. Shortly after the castration, administration of very small quantities of ethinyl estradiol (0.02 to 0.05 mg. per day, orally) was resumed, mainly in order to maintain the gynecomastia. It could not be decided whether the estrogen treatment had any influence on the growth of hair. The patient underwent treatment by electrolysis to prevent the growth of beard, which had never been remarkable; he also let his hair grow freely. The former feminine features were accentuated to such a degree that only the presence of the penis and scrotum revealed that he was not a girl. The behavior, gait, and voice production were all strongly feminine.

The patient had one final ardent wish: to have the last visible remains of the detested masculinity removed. This wish persisted one year after castration, and amputation of the penis and plastic surgery of the scrotum had to be considered, since their presence meant a mental load on the patient. The patient was admitted to the surgical department of the Copenhagen University Hospital. After it had been established that no legal complications would follow the operation as planned, the penis was removed, with implantation in the perineum of the urethra dissected from the corpora cavernosa. By plastic skin surgery the scrotum was transformed into labia-like formations. There was no intention of creating an artificial vagina by inlay grafting according to the technique of McIndoe, nor was this a wish of the patient, in whom the sexual requirements were subordinate to the transvestic impulses. The operation was without complications, and the genital region now had a completely feminine appearance.

The goal was attained; by hormonal feminization and operative demasculinization the patient's soma harmonized with the pronounced feminine psyche. The sympathetic attitude shown by the authorities in issuing papers that enabled the patient to appear as a woman gave to the results obtained by medical treatment an importance of wider practical application. The patient will be able to move about freely among other persons, without anyone suspecting that this is not a normal young woman but a male transvestite whose highest wishes have been fulfilled by the assistance of the medical profession and by society. It is impossible, however, to say what future chances this patient will have.

COMMENT

As a social problem, eonism is of very slight importance, as it is an exceedingly rare affection, but from the patient's point of view it is the all-dominant problem, depriving him of any possible happiness from childhood to old age. A number of factors contribute toward the deterioration of the fate of the victims of this affection. The medical profession, on an average, knows too little about the nature of this disease; it is often confused or identified with homosexuality, from which it follows that

6. Hamburger, C., and Sprechler, M.: Influence of Steroid Hormones on Hormonal Activity of Adenohypophysis in Man, Acta endocrinol. 7: 167, 1951.

society has not been able to grasp properly the problems of transvestites. To this must be added the fact that there is no available means to cure transvestism.

It is understood in medical ethics that if a disease cannot be cured an attempt should be made to improve the stress and inconvenience of the patient in order to make his life as tolerable as possible, having, naturally, due regard to the interests of society. We are unable to agree with Cawadias,[2n] who wrote that while male transvestites "live unhappily and commit suicide when thwarted, overwhelming social considerations oblige the physician to ignore their will and thus their pragmatic sex." Following are the various possibilities available to facilitate the eonist's life and existence.

1. Permission to Wear Women's Clothes in Public.— Permission for men to wear women's clothes in public was extensively granted in Germany at the time of Magnus Hirschfeld, provided the authorities were satisfied that such permission was necessary for the mental well-being of the patient. If the permission is made subject to the patient's not outraging public decency, no social inconveniences are attached to it. A number of patients will be able to adjust in this way; in other cases the method will prove inadequate.

2. Legal Recognition and Registration as a Woman.— Legal recognition and registration of the patient as a woman has been adopted in some cases. The procedure has the advantage that the patient can always appear as a woman, with a woman's name, without others knowing the true sex, and in this instance no social interests are violated.

3. Administration of Estrogenic Substances. — The aim of administration of estrogenic substances is the inhibition of the testicular function and the development of feminine features, e. g., gynecomastia, or the enhancement of preexisting feminization. Prolonged administration of estrogens should be avoided because of possible prostatic changes and the faint possibility of encouraging malignant tumors. If the presence of the testes is a threat to the mental balance of the patient, castration may have to be considered. As already mentioned, we consider it a *sine qua non* that administration of estrogenic substances be carried out (e. g., for a six months' period) before operative castration can be performed.

4. Castration. — Legislation as regards castration varies considerably from one country to another. In most countries castration is not allowed unless indicated by pathological changes in the sex glands. The sex glands must, in the eyes of society, be protected at any price. It is not immediately evident with what right society compels persons to tolerate the presence of these organs, if their presence is felt to be an intolerable burden, in some cases poisoning the patient's life from youth to old age. It is possible that the authorities are afraid that a number of homosexual and otherwise sexually abnormal persons might attempt to obtain castration, pretending to be transvestites. It is very unlikely that this would happen to any appreciable degree; the majority of homosexual, like heterosexual, men regard castration as a definitely undesirable measure. At any rate, from a eugenic point of view it would do no harm if a number of sexually abnormal men were castrated and thus deprived of their sexual libido. It might be feared that the patients would later regret the operation. This is a weighty consideration, but if an adult man of sound mind, after having been told the risks of the operation and after careful consideration, himself accepts the responsibility and persists in his wish, it is unreasonable that society should act as a guardian endowed with a superior wisdom. Moreover, the danger of regret on the part of the patient may be considerably reduced if operative castration is preceded by hormonal castration during a sufficiently long period, with careful observation of the patient by skilled psychiatrists.

5. Demasculinization. — If operative castration has been carried out (and in certain cases the patient may have obtained permission to appear publicly in women's clothes) there can be no serious objection to amputation of the penis and plastic surgery of the scrotum in order that the patient's external genital region may appear to be purely feminine. In many instances this will be a natural and logical wish on the part of the patient, and the risk involved is so negligible that this is no contraindication against the operation.

6. Formation of Artificial Vagina. — Even if McIndoe's method is applied, the technical difficulties in this operation may perhaps exceed those in women with aplasia of the vagina. In cases of genuine transvestism the question will only rarely arise, because the need of sexual contact is usually of very minor importance. Furthermore, such operation may be undesirable from an ethical point of view.

These measures aim at making life tolerable for the transvestite, but they must not be applied as hard and fast rules, since in this affection there can never be any standard and routine treatment. Each step must be very carefully considered by a team of medical specialists, and it may not always be possible to comply with the patient's wishes. One of the major points to be considered is the patient's habitus. The chances that a man with pronounced masculine proportions, strong and dark growth of beard, considerable growth of body hair, etc., should be able to appear as and resemble a woman are slight; in such cases it is far more difficult to attain the object of the treatment—to create a harmonious balance between soma and psyche—than in persons who have already pronounced feminine habitus.

After having treated the present patient we have discovered an analogous case in Germany, in which operation was performed in 1943. In this case, reported by Huelke,[7] the patient was a man of 35 who had appeared as a woman from his 17th year. Castration and amputation of the penis were carried out, and at a postoperative examination six months later the patient was still satisfied with life as a woman.

We would like to add that after the beginning of December, 1952, we have received hundreds of letters, even from the remotest parts of the world, from patients seeking help in their sexual difficulties. Among these there are about 60 writers who are very probably victims of genuine transvestism. Their reports and letters make

7. Huelke, H. H.: Ein Transvestit: Der Fall Heinrich B., Kriminalistik 3: 91, 1949.

extremely reliable impressions; many are thorough and factual case histories, often accompanied by photographs. It has been an exceedingly depressing experience to learn the degree to which these persons feel they have been let down by the medical profession and by their fellow men. In loneliness and misery they have had to fight their own tragic fate. It would be desirable if the medical profession and the authorities concerned showed, in future, a more positive attitude toward the efforts at easing and facilitating the daily life of the victims of genuine transvestism.

SUMMARY

On the basis of previously published reports, personal observations, and letters from patients, the symptoms, course, and possible origin of transvestism are discussed. It is emphasized that, among the patients with transvestic tendencies, a fairly small group of men can be singled out. Their feeling of being a woman is so rooted and irresistible that it is reasonable to apply a special term in these cases—that of "genuine transvestism" or "eonism." It is highly probable that eonism is constitutionally conditioned, and the working theory is put forward that some eonists, at any rate, are intersexes of the highest degree, i. e., *Umwandlungsmänner,* according to Goldschmidt's intersex theory. It is recognized that there exist no available means to cure eonism, and all efforts must, therefore, be concentrated on making life easier for such persons.

A case of genuine transvestism in a young man is reported. His psyche was definitely, and his physical appearance moderately, feminine. Besides the transvestic tendencies he had a pronounced aversion for his own genitals. After hormonal castration, brought about by administration of estrogens (with the patient under careful psychiatric surveillance), operative castration and, later, amputation of the penis and plastic surgery of the scrotum were performed. The patient obtained official permission to appear publicly in women's clothes. The various "therapeutic" measures to create for transvestites a tolerable existence are discussed. It is emphasized that several of these measures could be brought into use in suitable cases without violating the interests of society.

UNNECESSARY ROUTINE ORDERS

Samuel P. Harbison, M.D., Pittsburgh

Even in this age of science and reason it would appear that we as surgeons carry out certain time-honored practices that have no true rational basis. If these practices were harmless as well as ineffective, it would be less important to discuss them; some are harmful, however, and some contribute significantly to the discomfort of the patient. There seems to be no reason to continue certain ones, and others should be studied and reevaluated by scientific means. For the most part such practices survive because they have for a long time been incorporated in "routine" preoperative and postoperative orders and hence have not been subjected often enough to close scrutiny. I refer to such routine matters as use of morphine, enemas, deprivation of fluids, and shaving preoperatively, and to the use of morphine, hypodermic medication, enemas, and diet postoperatively. The operative procedure itself should not be omitted from consideration, since it is easy through habit and consequent sterility of thought to persist in procedures not supported by adequate evidence. In the main the discussion is limited to abdominal surgery, although applications elsewhere will be readily apparent.

There undoubtedly will be disagreement with some or many of the following statements, unsupported as they are by scientific proof. This disagreement may encourage further study and thought, however, and insofar as it does the paper will be worth while. Studies in relation to these matters are being carried out at the present time, and something somewhat more scientific will be forthcoming in the future. For the present the art of medicine and the art of common sense are being stressed.

From the Department of Surgery, University of Pittsburgh School of Medicine.

1. Deleted on proof.

PREOPERATIVE PREPARATION

To most patients the preoperative phase of their ordeal is very important, especially for those subjected to surgery for the first time. Their surroundings are strange; there is apprehension concerning the outcome of the operation—regarding morbidity and pain as well as mortality. Then come enemas, shaving, deprivation of fluid, and administration of drugs by hypodermic injections. Must all these procedures be routine for all patients? How can we make the preoperative phase less of an ordeal? The enema deserves particular scrutiny. The bowel habits of most persons result in evacuation sometime during the daylight hours. No organic toxicity develops from the presence of feces in the normal colon for several days or even weeks. In the hydrated patient fecal impaction is not common. Evacuation of bowel content on the operating table is an unusual occurrence, and of little consequence, except esthetically, when it does occur. Then why do we order an enema the night before operation for all major surgery? The time is wrong, the need is highly questionable, and the procedure is unpleasant for many to say the least. Unfortunately we are not content to order a saline solution or water enema, but must add soap or other chemicals to irritate and to inflame the otherwise normal colon. Certainly this is not very conducive to rest the night before an operation, and to one who has never had an enema, the experience can be quite upsetting. To a child it may be terrifying. The enema even appears on certain standard orders prior to tonsillectomy in children! Having abolished the routine use of the enema five years ago, I can state that there have been no complications attributable to the omission and that the incidence of spontaneous evacuation under anesthesia has not increased. The patients are uniformly grateful, unless they

are enema addicts. This viewpoint, of course, excepts colon and rectal surgery, perineal work, or conditions in which there are other special indications. Even in these, however, if mechanical cleansing is desired, the least irritating fluid entailing the least dehydration of the patient would seem to be indicated, and this fluid is probably saline solution.

The operative site is shaved by nurses and orderlies, and the extent of shaving is often determined by outdated nursing procedure books. It is obviously desirable in the operative area but need not extend to far removed areas, nor be so conscientiously done as to remove streaks of epidermis. Shaving of the pubic area for upper abdominal surgery is an unnecessary extension of the operative site and certainly adds to the patient's discomfort, both emotionally and physically. In the occasional case where the unexpected occurs, the field can be reprepared and redraped. At one hospital routine preparation for thoracic surgery includes shaving of, besides the chest and axilla, the upper arm, forearm, hand, and fingers on the affected side. The reason given for including the forearm and hand was that the anesthetist could better find and more deftly pierce the veins. I am quite sure this routine was not dictated by reason.

The use of morphine is known to be followed in some 10 or 15% of cases by nausea and often vomiting,[2] yet preoperative medication in too many hospitals still consists of routine administration of morphine and atropine. Administration of the drug is discontinued postoperatively only after the appearance of the complications. Studies in progress at our hospital [3] demonstrate the decrease of nausea following the omission of morphine as a preanesthetic agent; our anesthetists are now convinced that the drug is not unique in allaying apprehension as was formerly thought. The barbiturates seem to be even more satisfactory, or at least equally as satisfactory, for both allaying apprehension and sedation. The newer anesthetic agents allowing rapid induction have also lessened the need for heavy sedation.

Deprivation of all fluid by mouth "after midnight" is another order that needs some studying, especially in young children undergoing major procedures. Even a stomach whose motility is altered by apprehension hardly needs 8 to 12 hours to empty itself. The excessive dryness of the mouth and thirst that is often noticed immediately before induction of anesthesia is not comfortable and probably, despite the necessity of using atropine, can be allayed in the majority of cases by allowing taking of water by mouth until three to four hours before surgery. In certain cases, when patients are diabetic or elderly, for instance, it is dangerous to omit fluids for too long a time, and an intravenous injection interfering with sleep need not be the only way to combat the danger. Patients should not come to operation even slightly dehydrated. Again, smooth and quick induction of anesthesia lowers the hazard of any small amounts of liquid left in the stomach.

The recognized efficiency of the nasogastric tube should not make its use routine for all gastric and duodenal operations. Its insertion is disturbing and to use it in cases without obstruction or delay in emptying is absurd. Over three-fourths of our subtotal gastric resections are safely and adequately handled without the use of the tube pre- or postoperatively. It can be easily inserted in the unconscious person if the need during operation occurs. Its routine use in other types of abdominal surgery is again not justified. When indications for its use are present, however, they must be promptly acted on.

In the operating room the surgeon will naturally have certain fixed techniques and ways of doing things, and these are necessary for the efficient functioning of the entire professional team. But occasionally here also the routine may verge on "humbug." It is necessary only to point out the fallacy of too strict adherence to routine procedure. The surgeon who always uses a vertical abdominal incision or always a transverse, for example, obviously does not realize the value of each type, depending upon the shape of the abdomen, the possibilities of alternate diagnoses, and the relationship to pain. There are quite important indications for each general type. The same thinking applies to suture material. Exclusive use of absorbable or nonabsorbable sutures—so that we have the "silk surgeon," the "cotton surgeon," the "wire surgeon," or "catgut surgeon"—is again untenable on common sense grounds. Variation in results depends on the surgeon rather than on the suture.[4] It seems rational to use absorbable sutures in the mucosal layers of anastomoses where sloughing must occur, and to use nonabsorbable material where strength with minimal reaction is needed as in the outside layer. When time occasionally becomes a factor, a double row of continuous absorbable surgical suture serves admirably. In other situations steel wire has its devotees; let them not be so devoted as to place buried wire in patients with scanty subcutaneous tissue, or in patients whose subcutaneous tissue may be expected to atrophy shortly. And for those who believe that silk or clips are the only suitable materials to close the skin, let them try subcuticular absorbable suture in the infant herniorrhaphy. No dressing is required, and no sutures need be removed.

Then there is the dressing. Sealing the wound completely with adhesive plaster leads to perspiration, discomfort, and sometimes odor; using a light flimsy dressing on an abdominal incision does not give the patient much comfort when he coughs, vomits, or sneezes. Give the patient support by adhesive plaster or binder, and allow the wound to have a little access to air. Extended protection of the clean healed incision is another humbug. Thousands of wounds treated by delayed primary closure were personally observed during the war.[4] In order to rehabilitate the patient as rapidly as possible after a soft tissue wound, no dressing whatever was used after removal of the sutures, providing that the healing had been clean and coaptation of the skin edges accurate. Psychologically the absence of a dressing after about seven days was felt to be advantageous. This practice has been carried out in the years since the war on abdominal and other

2. Rubin, A., and Winston, J.: Role of Vestibular Apparatus in Production of Nausea and Vomiting Following the Administration of Morphine to Man: Clinical and Experimental Data Including Effects of Dramamine and Benzedrine, J. Clin. Investigation **29**: 1261-1266 (Oct.) 1950. Gruber, C. M., Jr.; Lee, K. S.; Laszicenko, Z. T., and Gruber, C. M.: Comparison of Actions of Dromoran (Nu-2206) and Morphine in Production of Vomiting, Proc. Soc. Exp. Biol. & Med. **78**: 803-804 (Dec.) 1951. Salter, W. T., and White, M. L.: Morphine "Sensitivity," Anesthesiology **10**: 553-561 (Sept.) 1949.

3. Monheim, L. M.: Personal communication to the author.

4. Harbison, S. P.: The Reparative Surgery of Soft Part Wounds, Surgery **22**: 347-359 (Aug.) 1947.

incisions without a single cause for regret. After removal of sutures, abdominal incisions may be supported where indicated by adhesive strips (unflamed) to be removed by the patient in three or four days. Bathing is permitted immediately. In this connection it is interesting to read the recent report of Heifetz and co-workers in regard to wound healing with no dressing at any time.[5]

POSTOPERATIVE CARE

The postoperative period is probably the most important from the standpoint of eliminating unnecessary procedures. The patient is uncomfortable and in a certain amount of pain, and is perhaps apprehensive. Procedures that add to this unpleasantness should be ones that are essential to his welfare. After abdominal surgery "nothing by mouth" for a varying period is the usual rule. In the absence of vomiting there is little need for strict adherence to such a regimen, and small sips of water are often a considerable comfort to the patient. (The presence of a nasogastric tube may prohibit this, however.) Even after esophageal surgery, water may be permitted with safety and would seem to be less harmful than saliva and regurgitated hydrochloric acid. Increasing the amount allowed depends on the patient's course, and it is not unusual for a gastrectomy patient to want, and be able, to take a pint or more of water on the day following operation. Early resumption of oral intake of fluids not only lessens the necessity for parenteral therapy but also provides a means of giving medications. Narcotics almost universally are given by hypodermic injection, and there seems little reason for this except custom. How strange to give a patient a barbiturate by mouth and at the same time or later administer morphine by syringe. The nurses will be most grateful for common sense in this regard. The time of action of the drug should not be an argument against oral administration if a patient's pain is anticipated and treated before it becomes severe.

Here again the enema is subject to review and condemnation. Need it or not, many patients routinely get an enema on the second to fourth day after abdominal surgery. Does it stimulate the bowel to activity if physiologically it is not ready for this activity? In low colon surgery we feel an enema is contraindicated, and we wait until normal evacuation occurs somewhere between the fourth to seventh day. Obviously in certain cases a small nonirritating enema with saline solution will help initiate evacuation, but it is surprising how it can be omitted in most cases. The incidence of fecal impaction seems to be about the same whether or not an enema is given early in the postoperative period. A further argument against the routine use of the enema lies in the patients' reactions to it. Many feel weak and tired after the procedure. Often, especially to the bed patient, it is an actual ordeal. Let us use the enema only when there are definite indications, and not prescribe it for everyone.

Widely variant opinions have been expressed in regard to diets following gastrointestinal surgery. Perhaps the most preposterous and unscientific regime is 21 day "gastroenterostomy diet." Certain carefully selected foods are added each day or so, with no regard for the patient's likes and dislikes, and very little regard for stomach physiology. And then there is the standard "clear liquids" to "soft" diet to "house" diet. Too often the clear liquids permit fruit juices, which often are nauseating, prohibit coffee to which the patient is accustomed, and permit tea to which he is not. The soft diet is next with its baby foods, unpalatable mixtures of gentle nutritious substances to soothe the healing intestine. Finally comes the regular diet, with many "injurious" foods withheld. What exactly does the surgeon try to accomplish following gastrointestinal surgery? Simply to allow healing to occur and to restore the patient's normal physiological functioning as soon as it is safely possible. There is no scientific evidence that certain food stuffs interfere with healing or are hazardous to an anastomosis. The regular full diets have been given by mistake without ill effects to too many patients who had recently been operated on to make this statement doubtful. Harm does result, however, from irritation to the freshly traumatized intestine, resulting in nausea and vomiting. Any type of food, even water, may cause this irritation. Therefore it would seem rational to base postoperative feeding on the individual patient's tolerance and subjective feelings. Appetite or desire for food is often a safer index of the time to begin feeding than is the presence of peristalsis. The desire for food at this time is usually a desire for a certain type or types of food that will "taste good," not necessarily for what is supposed to be "good" for the patient.

Individuals vary widely and there are many different abdominal operations that require special postoperative considerations, but as an average example of a rational feeding program a subtotal gastric resection for ulcer will suffice. It is assumed that the operation has been carried out uneventfully and that the surgeon sees no indication for use of a nasogastric tube. Sips of water are allowed on the operative day, the patient being made to understand that he must stop if discomfort, fullness, or nausea occur. On the first postoperative day most patients are content with water only, although there is no contraindication to tea, coffee, and ginger ale, if the patient requests them. They are never forced. On the second or third day solid food is given, if the patient desires it. He is asked what he would like to have. Again he is cautioned about not eating if discomfort, fullness, or nausea occurs. On the third, fourth, or fifth day a regular diet is allowed from which the patient selects only what he really wants. Ideally he should be offered only what he requests to avoid the sight and odor of distasteful foods and to prevent waste, but administratively this is difficult. Between the 7th and 10th days, assuming early ambulation, he should be ready to go home. His instructions are to eat what he wants, never to force himself, and to count on between-meal supplements for a month or so. Before he leaves he will almost invariably ask about foods that formerly upset him. He is told there are no prohibitions.

The time for resumption of full activity following operation is also a highly individual matter and should not be subjected to routine treatment. We know that for practical purposes clean incisions acquire their full strength in approximately three weeks. Therefore the time after that period before resumption of normal activity should depend principally on the patient's strength and general

5. Heifetz, C. J.; Lawrence, M. S., and Richards, F. O.: Comparison of Wound Healing With and Without Dressings, A. M. A. Arch. Surg. 65: 746-751 (Nov.) 1952.

rehabilitation, with variations depending on occupation. There should never be an arbitrary recovery time for any operation. With early ambulation this time in general has been greatly shortened.

SUMMARY

Attention has been directed towards the persistence of certain routine orders in managing patients undergoing abdominal surgery that would seem to have no rational or scientific basis. Patients should be treated individually, and greater respect should be accorded the body's own capabilities for repairing itself and restoring function following surgical procedures.

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CLINICAL NOTES

DANGER OF LUMBAR SYMPATHETIC BLOCKS DURING ANTICOAGULANT THERAPY

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Lumbar sympathetic block and anticoagulant therapy are of value in the treatment of many vascular disorders. In general, a block is indicated if there is vasospasm, and anticoagulants are given if there is possibility of thrombosis. Not infrequently both vasospasm and thrombosis are present, as in some cases of thrombophlebitis, embolism, or traumatic injury of a blood vessel. In such instances, one is tempted to employ lumbar block and anticoagulant therapy together; this involves a risk that has not been emphasized adequately.

One death has been reported by O'Connor, Preston, and Theis [1] in which a lumbar block used in combination with controlled anticoagulant therapy was a contributing factor. This was the case of an 80-year-old man suffering from frostbite of both lower extremities. This patient was treated with repeated bilateral blocks while receiving bishydroxycoumarin (Dicumarol) in controlled therapeutic doses. He died on the 11th day of treatment, and an autopsy revealed a large retroperitoneal hemorrhage on the left side.

Cole and Kleitsch [2] described the case of a 54-year-old man in whom thrombophlebitis developed after a fracture of the right leg. He was treated with bishydroxycoumarin in amounts that maintained the prothrombin time within a safe therapeutic range. Also, lumbar block was performed twice on the right side during the course of anticoagulant therapy. Three days after the last block was performed, a large hematoma in the right retroperitoneal area was explored and drained. The administration of anticoagulants was stopped, whole blood transfusions were given, and the patient responded satisfactorily.

In a series of cases reported by Lilly and Lee [3] in which complications developed because of anticoagulant therapy, three deaths suggested the incompatibility of lumbar sympathetic blocks and anticoagulant therapy. In addition to retroperitoneal hemorrhages, however, massive generalized hemorrhages were found in the three patients who died, which indicated that therapy with bishydroxycoumarin was not controlled.

We present three case reports in order to emphasize the danger of the simultaneous use of lumbar blocks and anticoagulant therapy.

REPORT OF CASES

CASE 1.—This patient was a 53-year-old white man with known hypertensive heart disease and auricular fibrillation. He was admitted to the hospital on Feb. 8, 1950, complaining of pain, coldness, and pallor of the left foot and toes. These symptoms developed suddenly six hours prior to admission. Examination revealed a markedly dyspneic and slightly cyanotic patient with a blood pressure of 220/140 mm. Hg and auricular fibrillation. The left foot was cold and white. No pulsations were palpable in the posterior tibial and dorsal pedal arteries, but a popliteal pulse was present. Laboratory studies showed normal bleeding, coagulation, and prothrombin times. The patient was treated with heparin, 100 mg. given intramuscularly every six hours, and a total of five left lumbar sympathetic blocks with 1% procaine hydrochloride were done. Because the foot became warm after each block, surgery was deferred. On Feb. 10, 1950, the patient complained of pain in the left lower quadrant of the abdomen. A tender mass was palpable in this area, but his general condition was unchanged. The next day severe nausea and vomiting developed, and the patient died quite suddenly. Beginning on Feb. 8, 1950, daily prothrombin times had been 57%, 41.5%, 48%, and 41.5% of normal. Postmortem examination revealed a large retroperitoneal hematoma on the left side as well as an embolus at the bifurcation of the left popliteal artery.

CASE 2.—A 42-year-old white man was admitted to the hospital on Dec. 29, 1950, two days after having incurred frostbite of both feet. He had walked 4 miles (6.44 km.) in subzero weather after which his toes and feet became painful, swollen, and red. Examination revealed edema, extreme tenderness, and bluish-red discoloration of the toes and feet to the midmetatarsal level bilaterally. Dorsal pedal and posterior tibial pulses were present on both sides. Administration of heparin was started, 50 mg. given intramuscularly every four hours, and the lumbar sympathetic chains were blocked with 1% procaine hydrochloride. On Jan. 2, 1951, the patient began vomiting and shortly thereafter complained of left lower quadrant abdominal pain. A poorly defined mass was noted in the left flank and lower quadrant. The red blood cell count was 2,500,000 per cubic millimeter, and the hemoglobin level was 6.5 gm. per 100 cc. Bleeding and coagulation times were normal, but administration of heparin was discontinued immediately, and blood transfusions were given. His condition improved, and the abdominal mass slowly disappeared. Subsequently, it was necessary to carry out bilateral transmetatarsal amputations.

CASE 3.—A 59-year-old white man was admitted to the hospital on Jan. 15, 1952, as a transfer patient from another institution in which he had been treated since Jan. 4, 1952, for the effects of a fall downstairs. When we saw him, he was incoherent, and the information accompanying him indicated that epilepsy and a left hemiparesis were the residual effects of an old cerebral vascular accident. The recent fall apparently

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1. O'Connor, W. R.; Preston, F. W., and Theis, F. V.: Retroperitoneal Hemorrhage Following Lumbar Sympathetic Block During Treatment with Dicumarol: Report of a Fatality, Ann. Surg. **131**: 575 (April) 1950.

2. Cole, F., and Kleitsch, W. P.: Incompatibility of Lumbar Block and Anticoagulant Therapy, J. A. M. A. **147**: 1233 (Nov. 24) 1951.

3. Lilly, G. D., and Lee, R. M.: Complications of Anticoagulant Therapy, Surgery **26**: 957 (Dec.) 1949.

had occurred during a seizure, and he was hospitalized for care of the resulting injuries. On Jan. 12, 1952, he complained of sudden pain in the right leg, and the next day "marked swelling and increasing discoloration" were noted. When examined on this admission, his blood pressure was 120/90 mm. Hg, and auricular fibrillation was present. Downward from a point just below the knee, the right leg was cold and cyanotic. All pulses were absent below the right femoral artery, and oscillometry showed obstruction in the lower third of the femoral artery. The patient was taken to the operating room at once, and an embolus and distal propagating thrombus were removed from the lower third of the femoral artery and from the popliteal artery. A patent lumen was established, and 50 mg. of heparin was instilled directly into it. Immediately after the operation was completed, a right lumbar block was performed and administration of heparin, 50 mg. every four hours intravenously, was started. Six hours later, the patient was in shock. He responded to 500 cc. of blood given intravenously and, because there was no evidence of hemorrhage discernible, administration of heparin was continued. The block was not repeated, however. Bleeding and coagulation times were normal. He remained anuric, with a nonprotein nitrogen level of 87.6 mg. per 100 cc., and finally died 18 hours after surgery. An autopsy revealed infarction of the right kidney and a large right perirenal hematoma.

COMMENT

The close anatomic relationship of the lumbar sympathetic chains to the inferior vena cava on the right side and to the lumbar veins on both sides makes it a commonplace occurrence for one of these vessels to be punctured during a routine sympathetic block. It is possible that the renal veins are also vulnerable. Arteries probably are not important because they have relatively thicker, more muscular walls that are likely to seal needle holes. On the other hand, the veins in the lumbar area have very thin walls and are embedded in loose fat and areolar tissue; furthermore, there are no confining fascial planes to limit a hematoma and exert pressure on a bleeding point. Ordinarily, the coagulability of blood overcomes these deficiencies and makes lumbar block comparatively safe, but, when the chief protective factor is removed by anticoagulant therapy, the risk involved in performing a block becomes alarmingly great. This is demonstrated adequately by two deaths in the three cases we report.

It is apparent that there is no way to avoid this catastrophe by modifying the technique by which a block is performed or by regulating the therapeutic dose of anticoagulants. In these three cases, blood coagulation time was maintained within safe limits as shown by laboratory tests and by the absence of bleeding elsewhere; therefore, because patients in whom both types of treatment might be indicated are often seriously ill and cannot tolerate blood loss well, it is imperative to select only one method of therapy. If, nevertheless, it should seem advisable to use lumbar sympathetic blocks in combination with anticoagulants, heparin should be administered intravenously; the block should not be done less than six hours after the last dose of heparin; and the next dose of heparin should not be given until one to two hours after the block. This schedule should permit sufficient time for the effects of heparin to be eliminated during the period of the block.

SUMMARY AND CONCLUSIONS

Two instances of retroperitoneal hemorrhage caused by lumbar sympathetic block used in conjunction with controlled anticoagulant therapy are reviewed. The cause was proved in one at autopsy and in the other at surgery. Three additional cases are described in which two deaths are attributed to lumbar sympathetic blocks having been performed while the patients were receiving anticoagulants. It is concluded that there is undue risk in using lumbar blocks and anticoagulants simultaneously.

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USE OF NITROGEN MUSTARDS DURING ACUTE HEPATITIS

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The nitrogen mustards have been used experimentally and clinically in the treatment of neoplasms and blood dyscrasias. According to Gilman and Philips,[1] their action is to interfere with the metabolism of cells in rapid mitosis, presumably by enzyme inactivation. To date, results have been of some clinical value only in certain blood dyscrasias and lymphomas, such as chronic myelogenous leukemia and Hodgkin's disease. The dosage and the frequency of administration have been limited by its toxicity to normal tissues. The organs most vulnerable to toxic effects are those whose mitosis occurs at a rapid rate, such as the bone marrow, the gastrointestinal tract, the testes, and the lymphatics. Goodman and co-workers [2] state that no evidence of liver damage was seen in humans with variou blood dyscrasias, when treated with nitrogen mustard. Jacobson and co-workers [3] report that, in various diseases with concomitant liver disease, no hepatic damage was seen during nitrogen mustard therapy. There are, however, no reports, to our knowledge, where a patient was known to have acute hepatitis and Hodgkin's disease and was treated with nitrogen mustard in the face of this complication. The following case report represents such an instance.

REPORT OF A CASE

The patient was a 49-year-old white woman with known Hodgkin's disease confirmed by cervical node biopsy three years earlier. Her initial clinical picture had been mild, but during the past year a severe panhematocytopenia and a marked splenomegaly developed that responded initially to small doses of x-ray therapy and transfusions. When the patient became refractory to x-ray therapy, nitrogen mustard was employed with good transient results. The clinical and hematological status would remain satisfactory until the spleen began to enlarge; then a rapid downhill picture reappeared. Nitrogen mustard was given intermittently with a total dosage of 28.5 mg. in the previous three months before she became jaundiced. Supportive transfusions had been used frequently in the past year, and, in the end of March, 1950, a typical acute hepatitis developed.

Physical examination revealed a thin, jaundiced woman of 49 years, with a temperature that rose daily to about 102 F. There was only one enlarged lymph node at the time, in the

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2. Goodman, L. S., and others: Nitrogen Mustard Therapy: Use of Methyl-*Bis*(β-Chloroethyl)Amine Hydrochloride and *Tris*(β-Chloroethyl) Amine Hydrochloride for Hodgkin's Disease, Lymphosarcoma, Leukemia and Certain Allied and Miscellaneous Disorders, J. A. M. A. **132**: 126 (Sept. 21) 1946.

3. Jacobson, L. O., and others: Nitrogen Mustard Therapy: Studies on the Effect of Methyl-Bis(Beta-Chloroethyl)Amine Hydrochloride on Neoplastic Diseases and Allied Disorders of the Hemopoietic System, J. A. M. A. **132**: 263 (Oct. 5) 1946.

right inguinal region. It was pea-sized, firm, and nontender. Examination of the heart and lungs was noncontributory. The spleen was very firm and thick, down two fingers before deep inspiration, and nontender. It had already begun to shrink, since the last two doses of nitrogen mustard were administered a few days before. The liver was down two fingers and was tender. Stool was alcoholic in color but moderately positive for bile. Hemoglobin was 60% (9 gm.) (Sahli), red blood cells 3 million, white blood cells 3,300, polymorphonuclear leukocytes 75 (8 nonfilamented), lymphocytes 24, and monocytes 1; platelets were decreased. Routine urinalysis was negative. Urinalysis was positive for bile and urobilinogen. Serum bilirubin was 8.4 mg. per 100 cc. Thymol turbidity was 13 units. Total proteins was 6.8 gm. per 100 cc. Zinc precipitation was 10 units, and phenol turbidity 23 units. The picture was that of acute hepatitis, probably related to the giving of the many lifesaving transfusions. There was no pain and no evidence of obstructive jaundice from any cause. The patient followed a characteristic course. Her stools were at first clay-colored, and the urine was dark, but they gradually returned towards normal. The symptoms of acute hepatitis subsided, but by two and one-half weeks the chills, fever, diaphoresis, splenomegaly, and supraclavicular lymph nodes reappeared. The patient's condition regressed, so that it was decided to use nitrogen mustard again, despite the hepatitis. On May 3, 1950, the liver studies revealed an improved but still abnormal serum bilirubin (9.1 mg. per 100 cc.). The other findings had not yet shown substantial change. Two doses of nitrogen mustard (methyl-*bis*[β-chloroethyl]-amine hydrochloride), 4.8 mg. each, were cautiously used on May 7 and May 14. On May 16 the serum bilirubin had declined to 5.9 mg. per 100 cc. and the other findings were steady. On May 27, 4.5 mg. were used. The dosage and interval of treatment were dictated by the clinical and hematological response of the Hodgkin's disease. On May 29 the serum bilirubin was 2.9 mg. per 100 cc. and there was evidence of progress in the thymol turbidity, with a decline of 15 units. The zinc precipitation fell from 46 units to 21 units, and the phenol turbidity from 23 units to 9 units. Between June 4 and June 13 a total of 19.2 mg. of nitrogen mustard was given in four divided doses. The phenol turbidity and total protein rose somewhat by June 16, but all other studies declined. By July 4 all five liver studies were satisfactory. It was felt that this course represented a satisfactory and undisturbed defervescence of the hepatitis. The Hodgkin's disease responded likewise in satisfactory fashion, with the temperature declining, the lymph nodes melting, and the spleen shrinking considerably.

Subsequently the patient responded less and less well to the nitrogen mustard. In view of the panhematocytopenia that accompanied each episode of splenic enlargement, it was decided in desperation to perform a splenectomy. On Sept. 11 this was done. It was technically difficult because of the size of the spleen, the many adhesions to surrounding structures, and the patient's poor condition. It was considered unwise to take a liver biopsy at the time. The spleen was characteristic of Hodgkin's disease and weighed 1,120 gm. The patient survived a month postoperatively and finally died on Oct. 15, 1950.

COMMENT

The possibility that a serum hepatitis will appear in diseases in which many blood transfusions are needed, is not small. In blood dyscrasias it is important to know if one may exhibit nitrogen mustard during such an event, since it is known to be toxic to cells whose mitotic rate is rapid. As Landing and co-workers [4] have shown, the normal liver parenchyma has slowly growing cells, and is relatively unmolested by nitrogen mustard; however, when liver tissue is damaged, it is replaced by rapidly growing new cells, which presumably would be susceptible to the toxic effects of this drug. In experimental animals Landing and co-workers [5] also showed that normal liver parenchyma tolerated one to two times the toxic dose of nitrogen mustard without damage. Graef and co-workers [6] found no impressive changes in the liver after nitrogen mustard therapy, just slight fatty infiltration and sometimes glycogen depletion. Barron and co-workers [7] found partial inhibition of urea synthesis by the liver, but no inhibition of choline oxidase as in the kidney. Gilman and Philips [1] also found inhibition of glycogen synthesis and some inhibition of respiration of liver slices. None of these findings were significant at doses that produced gastrointestinal, kidney, and marrow damage. In regenerating rat liver there was some slowing of mitosis experimentally, but this lasted only 24 to 48 hours and was not profound. Therefore the liver tolerated nitrogen mustard despite its increased mitotic rate.[4] From these important data and from the salutary response in our case, one seems justified in employing nitrogen mustard therapy in the presence of acute hepatitis. The effect of nitrogen mustard during a virus infection does not appear to be a problem. In fact, Johnson [8] employed these drugs in fowl leukosis, a disease similar to leukemia and caused by a virus. He reports that the disease was transmissible before therapy, but not thereafter.

SUMMARY

A case of concomitant Hodgkin's disease and acute hepatitis was presented. Despite the hepatitis it was necessary to control the Hodgkin's disease with nitrogen mustard. The blood dyscrasia responded satisfactorily during this time, and the course of the hepatitis was unaltered. This case demonstrated that nitrogen mustard did not appear to be hepatotoxic in the dosage employed, despite the presence of acute liver damage and the increased rate of mitosis of the regenerating liver cells.

103 E. 78th St.

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5. Landing, B. H., and others: Systemic Pathological Effects of Nitrogen Mustards, and a Comparison of Toxicity, Chemical Structure, and Cytotoxic Effect, with Reference to the Chemotherapy of Tumors, Cancer **2**: 1055 (Nov.) 1949.

6. Graef, I., and others: The Clinical and Pathologic Effects of Nitrogen and Sulphur Mustards in Laboratory Animals, Am. J. Path. **24**: 1 (Jan.) 1948.

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Actinomycosis of the Spine.—When primary in the vertebra actinomycosis produces an unusual change. The bone, when roentgenographed, has a soap-bubble appearance. The pattern is one of multiple small areas of rarefaction surrounded throughout by zones of normal or dense bone. Collapse of the vertebral body is not particularly pronounced and there may be little change in the contour for long periods of time. Paravertebral soft tissue swelling is usually present, extending along the course of the involved segments and even beyond. Most often this is of a fusiform nature and not very conspicuous.

The peculiar soap-bubble type of change in the vertebra is, we believe, rather distinctive and, whenever encountered, the possibility of intrinsic or primary vertebral actinomycosis must be seriously considered. Other infections and neoplasms may at times present a similar roentgen appearance, but not very frequently.—G. J. Baylin, M.D., and J. M. Wear, M.D., Blastomycosis and Actinomycosis of the Spine, *The American Journal of Roentgenology, Radium Therapy and Nuclear Medicine,* March, 1953.

NITROGEN MUSTARD IN TREATMENT OF RHEUMATOID ARTHRITIS

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The value of corticotropin (ACTH) and cortisone in rheumatoid arthritis and allied diseases has been well established. The pituitary-adrenal axis relationship has been described by Selye [1] and others, and this has been the stimulus for various types of clinical application. Among the chemical agents used in the treatment of rheumatoid arthritis recently is nitrogen mustard, as reported by Diaz and co-workers.[2] Their preliminary report indicated that dramatic results could be expected with nitrogen mustard, and it was felt that further work along this line was indicated. Accordingly, a clinical study was undertaken, and, in addition, detailed laboratory studies were made to determine whether the usual excretion and retention results obtained with corticotropin and cortisone could be obtained.

PLAN OF STUDY

A series of seven patients was treated with nitrogen mustard. Four patients had rheumatoid arthritis, one had mixed arthritis, and the other two had gout. All were hospitalized during treatment. Each was given nitrogen mustard intravenously in a daily dose of 0.1 mg. per kilogram of body weight on two successive days. The average single dose was slightly over 6 mg. One patient (J. A.) received two courses of two doses each at intervals of six weeks. After administration of two doses, nausea and vomiting became so pronounced that additional treatment was considered unwise and perhaps too dangerous. Therefore our studies are based on administration of two doses instead of the four doses originally described by Diaz and associates.[2]

Prior to therapy, the following baseline laboratory studies were done: hemoglobin level determination, total and differential white blood cell counts, erythrocyte sedimentation rate (Westergren), and eosinophil count (Randolph). Reticulocyte counts were done also in three patients. Bone marrow examination was done prior to therapy on all except one of the patients (P. G.). A 24 hour urine determination was done prior to therapy for special studies, including urinary nitrogen, ammonia, sodium, and potassium level determinations, in all except one of the patients (B. H.).

TABLE 1.—*Effect of Nitrogen Mustard*

Patient	Age, Yr.	Sex	Race	Diagnosis	Stage of Disease	Sedimentation Rate, Mm.	Eosinophil Count/ Cu. Mm.	Hemoglobin, Gm.
B. H.	46	F	W	Rheumatoid arthritis	3	Before, 66 After, 49	Before, 88 After, 11	Before, 12.7 After, 12.1
M. L.	29	F	C	Rheumatoid arthritis	2	Before, 96 After, 90	Before, 44 After, 11	No change
M. B.	52	F	W	Rheumatoid arthritis	4	Before, 75 After, 55	Before, 495 After, 132	Before, 13.1 After, 12.4
W. H.	40	F	W	Rheumatoid arthritis	3	Before, 70 After, 40	No change	Before, 14.3 16 days after, 11.7 1 month after, 13.2
P. G.	72	M	W	Mixed arthritis (rheumatoid, hypertrophic)	3	Before, 80 After, 33	Before, 176 After, 121	No change
C. J.	58	M	C	Gout	3	No change	No change	No change
J. A. (1st course)	37	M	C	Gout	4	No change	No change	No change
(2nd course)	37	M	C	Gout	4	No change	No change	Before, 10.8 After, 8.7

After the baseline laboratory data were obtained, nitrogen mustard was given intravenously on two successive days. Daily sedimentation rate determinations and eosinophil counts were done. The hemoglobin level and total and differential white blood cell determinations were obtained immediately after treatment and in the follow-up studies. Bone marrow examinations were done 24 hours after the second dose of nitrogen mustard was given and also one week later. Twenty-four hour urine specimens for nitrogen, ammonia, sodium, and potassium

Nitrogen mustard (Mustargen) for this study was supplied by Dr. A. Gibson, Merck & Company, Inc., Rahway, N. J.

From the Arthritis Clinic and wards of the Philadelphia General Hospital (Drs. Cohen, Rose, and Cooper), and the Department of Medicine, Jefferson Medical College (Dr. Cohen).

Bone marrow studies were done by Dr. Elizabeth Mertens, Chief, Division of Clinical Pathology, and by Dr. Dean Pocock, Resident in Medicine, Philadelphia General Hospital. Urinary studies were done by Dr. Bernard Spur.

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2. Diaz, C. J.; Garcia, E. L.; Merchante, A., and Perianes, J.: Treatment of Rheumatoid Arthritis with Nitrogen Mustard: Preliminary Report, J. A. M. A. **147**: 1418-1419 (Dec. 8) 1951.

excretion studies were collected on two successive days, beginning 24 hours after the first injection of nitrogen mustard.

RESULTS

The clinical results and the effect on the blood cell counts of administration of nitrogen mustard are summarized in table 1. Briefly, it may be stated that no beneficial results were obtained clinically with the use of nitrogen mustard. The results reported by Diaz and associates [2] could not be substantiated. There was no significant effect on the blood determinations, except that several of the patients showed a drop in the hemoglobin level. With regard to the bone marrow studies, it can be said that, following therapy, some decrease in cellularity of the marrow was noted in all patients; however, the small group of patients studied makes it difficult to formulate definite conclusions. Nevertheless, either cytopenia or hypoplasia of the bone marrow should be considered a contraindication to the use of nitrogen mustard.

An effect on protein metabolism similar to that observed in some (unpublished) cases of arthritic patients receiving cortisone and corticotropin was noted. There appeared to be a catabolic effect, with increased nitrogen elimination noted in all patients except one (M. B.) and increased elimination of ammonia noted in all patients. No special effect on the sodium chloride or potassium elimination was observed (table 2). The increases in nitrogen elimination ranged from 18.7% (P. G.) to 62% (C. J.). The ammonia elimination increase ranged from 33% (M. B.) to more than 1,500% (J. A.). Three patients were investigated for elimination of sodium and potassium. No retention of sodium was observed. Increased potassium elimination was observed in one patient (J. A., the same patient in whom the greatest elimination of ammonia was observed).

Administration in Seven Patients

Total White Blood Cell Count/ Cu. Mm.	Differential White Blood Cell Count	Reticulocyte Count, %	Subjective Improvement	Objective Improvement	Side-Effects of Nitrogen Mustard	Comments
No change	No change	No change	Less pain in left ankle. All other joints same as before treatment	No change	Vomiting	Follow-up 2½ months after treatment revealed that patient felt considerable pain, the same as before treatment
Before, 4,500 After, 3,900	No change	No change	Immediately after treatment, less stiffness and pain	Could make fist better with right hand	Vomiting	Follow-up 2 months after treatment revealed patient had as much pain as before treatment
Before, 4,800 After, 3,600 1 month later, 4,900	No change	Before, 0.9 After, 1.5	No change	No change	Vomiting	No improvement after 2 months. Patient felt worse
Before, 6,600 After, 4,200 1 month later, 6,200	No change	No change	Felt a little better, less pain immediately after treatment	No change	Vomiting	Much improved 10 days after treatment; however, 1½ months later, same as before treatment
No change	No change	No change	Less pain in knees	No change	Vomiting	No improvement
Before, 6,400 After, 3,700	Neutrophils Before, 71% After, 38%	No change	No change	No change	Vomiting	No improvement
No change	No change	No change	Less pain	No change	None	Felt less pain after treatment; however has far-advanced case of gout and grasps at "straws"; actually had questionable improvement
No change	No change	No change	No change	No change	Vomiting	No definite improvement

TABLE 2.—*Results of Urine Studies Before and After Administration of Nitrogen Mustard*

Patient	Total 24 Hr. Excretion: Nitrogen, Gm.	Ammonia, Gm.	Sodium Chloride, Gm.	Potassium, mEq.
M. B.				
Before	45.7	0.242	....	....
24 hr. after	35.8	0.323	....	....
M. L.				
Before	34.9	0.114	....	....
24 hr. after	45.6	0.111	....	....
48 hr. after	48.7	0.245	....	....
W. H.				
Before	40.6	0.083	....	....
24 hr. after	84.0	0.155	....	....
48 hr. after	76.0	0.186	....	....
J. A.				
1st course				
Before	25.9	0.132	....	13.1
24 hr. after	47.8	2.160	....	46.0
2nd course				
24 hr. after	48.1	0.228	2.40	33.7
48 hr. after	30.4	0.316	5.50	35.0
C. J.				
Before	139.0	0.748	3.08	71.0
24 hr. after	225.0	1.150	3.14	50.0
48 hr. after	131.0	0.749	3.20	45.0
P. G.				
Before	55.8	0.187	9.00	83.0
24 hr. after	66.0	0.423	9.00	66.0
48 hr. after	66.2	0.418	8.80	86.0
72 hr. after	49.7	0.116	4.80	56.0

SUMMARY

The report by other investigators using nitrogen mustard in the treatment of rheumatoid arthritis could not be substantiated by us; no clinical improvement was noted in seven patients with the use of this agent. Nitrogen mustard should not be given indiscriminately because of the possibility of the occurrence of toxic bone marrow changes. Nitrogen mustard did show corticotropin-like action from the laboratory standpoint, in that an apparent catabolic effect was noted on protein metabolism, i. e., there was increased nitrogen and ammonia in the urine following the use of nitrogen mustard.

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CHEILITIS CAUSED BY CINNAMON (CASSIA) OIL IN TOOTH PASTE

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Cheilitis and stomatitis are disorders commonly seen in clinical practice. Zakon, Goldberg, and Kahn [1] reported 32 cases of cheilitis due to lipstick (the commonest offenders in this group being the bromfluorescein dyes) and, in reviewing the literature, found many additional causative agents, including actinic or chemically active rays of sunlight, allergy to cold, carmine, aniline, and eosin dyes in lip rouge, trout, methyl heptane carbonate in the perfume of lipstick, dental plates (Hecolite), denture creams containing anise oil, mouth washes, cigarette holders, bromfluorescein dyes, mustache wax, amalgam fillings for teeth, oil of cloves, orange juice, tomato juice, hexylresorcinol, Italian reed, metal containers for lipstick, mango rinds, tincture of Krameria, sage tea, and strong artificial lights such as carbon arcs.

Only one case of cheilitis caused by cinnamon (cassia) oil has been reported previously. Miller [2] reported the case of a woman who contracted cheilitis after approximately five weeks' exposure to the vapor of cinnamon oil used as a flavoring agent in bubble gum. Patch tests with 1% cinnamon oil in alcohol gave a 1+ reaction; with a 2% solution the reaction was 4+.

Dermatitis caused by cinnamon or cinnamon oil is a relatively rare entity or one that is rarely reported. In addition to the cited case report, only five additional references have been found in the literature. White and Boston [3] reported the first case in 1897, concerning a woman in whom dermatitis of the hands, face, and abdomen developed as a result of dipping toothpicks into cinnamon oil to flavor them. Tulipan [4] proved by patch tests that cinnamon powder was the causative agent in the case of a baker who had a chronic dermatitis of the hands. Silvers [5] reported one case of stomatitis and dermatitis venenata with purpura resulting from the use of oil of cloves and oil of cinnamon. Howell,[6] in a review of all the cases of contact dermatitis seen in a single year, found one case of dermatitis in a baker who had lesions on the fingers and hands caused by cinnamon powder. Downing [7] described the case of a candymaker who had dermatitis of the hands traced to contact with cinnamon oil; a patch test resulted in a generalized dermatitis. Leifer [8] reported the case of a woman who had chronic vesicular dermatitis of the hands of five years' duration, attributed to cinnamon oil used as a flavoring agent in a tooth paste. The ingestion of cinnamon oil (0.4 cc. in a capsule) resulted in a vesicular eruption on the previously affected digits the following day and in pruritus of the hands five days later.

The following case is presented because it is believed to be the first reported case of cheilitis caused by synthetic cinnamon oil used as a flavoring agent in tooth paste.

REPORT OF A CASE

A 22-year-old white woman was first seen on Jan. 23, 1952, with the chief complaint of "cold sores" around the mouth of approximately two weeks' duration. The onset had been characterized by the appearance over the lips of small pruritic blisters that subsequently broke and gradually spread to involve the entire circumoral area. The patient had applied cold cream for two weeks, during which time she noted continued progression of the lesions. When first seen she had multiple vesicular lesions with golden-colored crusts on the lips and surrounding skin. There was no involvement of the mucous membranes of the mouth. Examination was not otherwise significant. A diagnosis of herpes simplex was made, and the patient was advised to use compresses of aluminum acetate (Burow's solution) on the lips with an antibiotic ointment applied locally.

When the patient was next seen, on Jan. 29, 1952, little improvement was evident in the lesions, and, on this occasion, new patches of vesicles with surrounding erythema and slight edema were noted beneath the right eye and over a 3 cm., irregularly circumscribed area on the dorsum of the right hand. At this time, it was learned that two weeks prior to the onset of the dermatitis, the patient had changed her dentifrice to an ammoniated tooth paste and, at about the same time, had also begun to use a different brand of nail polish remover. She was instructed to discontinue use of all cosmetics and the ammoniated tooth paste and to bring samples of these substances for patch testing at her next visit. By Feb. 3, 1952, five days after discontinuance of the use of the tooth paste and the cosmetics, all of the involved areas were completely free of lesions.

Patch tests were done with the tooth paste, two shades of lipstick that had been used during this period, and the nail polish remover. Forty-eight hours later, a 3+ positive reaction to the tooth paste was present, but there was no reaction to the other three materials tested. Upon request the manufacturer supplied samples of the various components of the tooth paste, and patch tests were made of each. Results of tests with the following agents were negative: calcium phosphate (10% in water), urea (10% in water), glycerin, sorbitol (5% in water), dichlorodihydroxydiphenylmethane (G-4 Baxin) (10% in 95% ethyl alcohol), detergent solution (5% in water), diammonium phosphate (5% in water), carboxymethylcellulose (5% in water), anise oil (25% in cottonseed oil), peppermint oil (25% in cottonseed oil), and methyl salicylate (2% in cottonseed oil). Tests of a mixture of the anise oil, synthetic cinnamon oil, peppermint oil, and methyl salicylate, and of synthetic cinnamon oil alone (1% in 70% ethyl alcohol) showed 4+ reactions. A subsequent patch test

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The opinions expressed are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

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with natural cinnamon oil (5% in olive oil) also produced a 4+ reaction. Twenty control patients were tested with anise oil and cinnamon oil on two separate occasions one week apart. All patch tests were negative.

The patient was carefully questioned concerning the use of cinnamon powder in cooking and ingestion of it in various foods. She had never noted any skin lesions following its use and, after the above investigations were carried out, was able to handle cinnamon in cooking and also to eat it on rolls or toast without any harmful effects. A patch test with stick cinnamon, however, was reported by the patient to have been positive.

COMMENT

In the case presented it is concluded that this patient acquired sensitivity to cinnamon oil during the period of three weeks in which she used a new ammoniated tooth paste. It is of interest to note that, although the skin was sensitized by the use of the tooth paste, as evidenced by the positive patch tests, the subsequent use of cinnamon powder did not result in any signs or symptoms of dermatitis. This may possibly be explained by the fact that true cinnamon powder is produced from the bark of Cinnamomum zeylanicum (Ceylon cinnamon), whereas cinnamon oil is the volatile oil distilled from leaves and twigs of Cinnamomum cassia Blume (Chinese cinnamon). Two oils of cinnamon are used in commerce; one produced from Ceylon cinnamon and the other from the Chinese cinnamon. The latter is the only official one at this time. It is used as a flavoring agent and also as a preservative to prevent mold growth. Cinnamon oil is incorporated in the official preparations of compound vanillin elixir, and aromatic cascara sagrada fluidextract.

There is another interesting ramification of this case. Ammoniated tooth pastes are relatively new to the commercial market, and, as a result, the new components have been viewed with much more suspicion than compounds that have been used for a considerable period of time. An example of this point of view is in the case report by Fisher and Lipton.[9] This article described a case of allergic stomatitis simulating a vitamin deficiency but found, instead, to be caused by Baxin (dichlorodihydroxydiphenylmethane). Baxin is an antiseptic that recently has been added to some soaps and tooth pastes and was a component of both the tooth paste that caused the stomatitis reported by Fisher and Lipton [9] and the tooth paste that was the causative agent in the case presented. Our investigations subsequently ruled out Baxin as the causative agent of the cheilitis, illustrating the point that the newness of a compound does not in any way imply incrimination and that careful investigations must be made to arrive at the proper conclusions.

SUMMARY

A proved case of cheilitis caused by sensitivity to synthetic cinnamon (cassia) oil has been reported. Patch tests with various cosmetics and tooth pastes established that an ammoniated tooth paste was the causative agent and, further, that synthetic cinnamon oil, one of the constituents, was the specific causative agent. Complete cure of the lesions followed cessation of use of the tooth paste.

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SPECIAL ARTICLE

PRIMER ON THE RHEUMATIC DISEASES

Prepared by a Committee of the American Rheumatism Association

Following is the second part of the revision of the Primer on the Rheumatic Diseases that was published in THE JOURNAL, *April 16, 1949. The first part of the revision appeared in* THE JOURNAL, *May 23, 1953. The remainder will appear in the June 6 issue.*—ED.

RHEUMATOID ARTHRITIS

ETIOLOGY

Rheumatoid arthritis is a disease of unknown cause. It has a slight tendency to be familial; the sex ratio in peripheral rheumatoid arthritis is 3 women to 1 man, and 80% of the cases occur between the ages of 25 to 50, with the peak at 35 to 40. No indexes of abnormal function of the pituitary or adrenal glands can be detected by current methods. Rheumatoid arthritis is variously claimed to be (1) an infectious disease, (2) a metabolic disease, (3) a disease with an endocrinologic basis, (4) a disease of the peripheral circulatory apparatus, (5) a disease of the nervous system, (6) a psychogenic disease, and (7) a disease of hypersensitivity. Such a list indicates how little actually is known about the cause of this disease.

PATHOLOGY

Rheumatoid arthritis is invariably described as a systemic disorder. Scudamore, as early as 1827, pointed out that the disease is essentially one of dense white fibrous tissue. More recently it has been suggested that the disease affects primarily the interfibrillar substance of connective tissue. This substance is a colloidal, jelly-like material, existing in the interstices between cells and fibers of mesenchymal origin. This concept is consistent with the widespread nature of the lesions in rheumatoid arthritis.

Articular Lesions.—The articular lesions vary greatly with the stage and severity of the disease, but early in the illness there is proliferation of the synovial cells, with thickening of the synovial lining. The cartilage loses its normal luster and may show superficial ulcerations. As the disease progresses, the articular cartilage appears grayish-white, is softer, and may contain larger ulcerations. Proliferating connective tissue is also seen in the subchondral marrow spaces. The cartilage is surrounded by granulation tissue and may be destroyed, and fibrous ankylosis, which may become bony, follows. Late in the disease the bony cortex of the adjoining bone is reduced in thickness and the trabeculae are fewer in number.

Microscopically, in the active phase of the disease the synovial tissue shows proliferation of the lining cells, increased vascularity, and varying grades of cellular infiltration, which may or may not be perivascular. The majority of the infiltrating cells are lymphocytes. Focal

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collections of lymphocytes, whether perivascular or not, are seen frequently. Similar cellular infiltrations may be observed in the bone marrow, which may contain an increased number of plasma cells. These changes are not specific, and an absolute diagnosis is often impossible from the microscopic appearance alone.

Subcutaneous Nodules.—The subcutaneous nodules of rheumatoid arthritis constitute the one characteristic pathological lesion of the disease. These are similar to the nodules of rheumatic fever, and many observers believe that pathologically the nodules in the two diseases are essentially the same and that such differences as occur are explainable on the basis of the greater age and size of those of rheumatoid arthritis. Exudation of plasma and blood cells is a prominent microscopic feature of rheumatic fever nodules, which contain, in addition, small focal areas resembling Aschoff bodies. In the nodules of rheumatoid arthritis proliferation and degeneration predominate, Aschoff-like nodules are rare, and exudation is not a prominent feature. The vascular changes seen in such nodules vary from perivascular infiltration of inflammatory cells to diffuse inflammation and degeneration of the entire wall. Thrombosis is observed more commonly in the nodules of rheumatoid arthritis. Evidence has recently been presented again to indicate that the primary lesion in these nodules is an inflammatory process in the wall of a blood vessel leading to infarction and necrosis.

Infiltration in Skeletal Muscles.—Lymphocytic infiltrations in the skeletal muscles have been described in rheumatoid arthritis, as well as in other diseases, and cannot be considered pathologically specific. Similar collections of lymphocytes have been described in the sheaths of large peripheral nerves in rheumatoid arthritis.

Extra-Articular Lesions. — Extra-articular lesions have been noted in rare instances in the pleura and pericardium, and pericarditis is occasionally encountered. Occasionally nodules are seen in various viscera. Signs of cardiac valvulitis are found no more frequently in life in patients with rheumatoid arthritis than in the general population. At autopsy, there are conflicting reports as to the incidence of lesions thought to resemble those of rheumatic fever in the hearts of patients with rheumatoid arthritis, the figures varying from 15 to 50%.

CLINICAL FEATURES

Onset.—Many authors refer to prodromal symptoms, but, as the onset of the disease is frequently insidious, it is impossible to be sure that these symptoms do not actually constitute a part of the disease itself. In many instances the initial complaints are those of fatigue, exhaustion, lassitude, vasomotor disturbances, paresthesias, muscular stiffness, loss of weight, and general debility. Since similar symptoms become more pronounced in later stages of the disease, it is probable that the onset has already occurred by the time these symptoms have appeared.

In 75% of patients, the disease begins insidiously. One or more joints gradually become swollen and painful, and others follow slowly. There may be comparatively little systemic reaction during the early stages. In other instances the onset is more subacute in character. There may be repeated mild attacks of polyarthritis accompanied by pain, swelling, and redness of the affected joints, together with constitutional disturbances such as slight fever, tachycardia, and mild leukocytosis. The feet may be the first joints involved, with the characteristic changes in the hands appearing only later. Finally, in a certain proportion of patients the disease begins as acute polyarthritis with high fever and leukocytosis, and, in the initial stages, simulates rheumatic fever.

Clinical Features of the Articular Lesions.—In typical patients the articular involvement is distributed symmetrically. The smaller joints of the hands are particularly prone to be affected, especially the proximal interphalangeal joints of the fingers. For some reason the terminal interphalangeal joints usually escape. In this respect it usually differs from degenerative joint disease. In instances of severe disease, almost every joint in the body may become involved.

A typical rheumatoid joint presents a characteristic appearance. As a rule, swelling, pain, and limitation of movement are present and the nature of the swelling is rather distinctive. Owing to the thickening of the periarticular tissues and the atrophy of the muscles above and below, the joint presents a spindle-shaped appearance. The adjacent bursae and tendon sheaths are frequently involved, much of the swelling being due to synovial proliferation and edema.

While rheumatoid arthritis may become arrested or quiescent at any stage, it frequently proceeds to a chronic condition. The muscles about a joint usually fall into two groups acting as antagonists, of which one is stronger than the other. When the joint becomes inflamed and painful, muscle splinting involuntarily occurs, with an element of persistent contraction. The stronger of the groups exerts the greater pull and, since this is usually the flexors, the result is a flexion contracture. The periarticular swelling gradually subsides, and contractures assume greater importance. The changes are likely to be particularly apparent in the hands, wrists, knees, elbows and toes, but almost every joint in the body may be involved. In cases of advanced disease fibrous and bony ankylosis may occur, accompanied by subluxation or dislocation of the affected joints.

Muscular Weakness and Atrophy.—Muscular weakness and atrophy are prominent in rheumatoid arthritis and often constitute one of the most striking features. Atrophy may be particularly noticeable in the muscles of the hands, but may also occur in the muscles of the extremities and contribute to the fusiform appearance of the joints. In the opinion of many observers, the muscular atrophy is an integral part of the disease and is not solely attributable to disuse and muscular malnutrition associated with persistent contraction.

Cutaneous Changes.—The skin of the extremities frequently becomes smooth, glossy, and atrophic, and there may be redness of the thenar and hypothenar eminences. The hands are usually cold and clammy. The incidence of psoriasis is about 3%.

Subcutaneous Nodules.—Characteristic subcutaneous nodules occur in 15 to 20% of patients. The nodules are often found over the ulna distal to the olecranon, and less frequently over other bony prominences. They vary in size from scarcely palpable seed-like particles to lesions the size of an olive or larger. They are not painful except

when their position exposes them to undue pressure, when they become ulcerated and secondarily infected. The nodules are commonly located in sites exposed to frequent trauma. In contrast to the nodules of rheumatic fever, which last a matter of weeks or months, the rheumatoid nodules persist for months to years.

Constitutional Extra-Articular Manifestations. — In most instances, the temperature is slightly elevated in the early acute stages of the disease. In a few, fever up to 104 F may continue for weeks. There is usually moderate tachycardia and a decreased peripheral circulation.

The general nutrition may suffer severely in rheumatoid arthritis and in severe disease profound cachexia may develop. Various expressions of abnormal gastrointestinal function are often seen, which are believed to be secondary to the chronic debilitating nature of the disease. Joint changes indistinguishable from rheumatoid arthritis are present in 4% of patients with ulcerative colitis.

Splenic enlargement occurs in 5 to 10% of patients with the disease. Generalized lymphadenopathy of moderate degree is commonly observed. Pericarditis has been noted, and myocarditis and valvular lesions have been reported, but in these instances the presence of previous or concurrent rheumatic fever must be considered. Iritis and uveitis, often of an intractable nature, may accompany or precede rheumatoid arthritis, and may lead to blindness.

LABORATORY OBSERVATIONS

In rheumatoid arthritis there is usually a normocytic hypochromic anemia of the iron deficiency type that responds little if at all to the oral administration of iron. A temporary return to normal levels follows the intravenous administration of iron. The white blood cell count, the differential count, and the platelets are within normal limits in most patients. The erythrocyte sedimentation rate is almost always rapid, although exceptions are noted during the active disease. Group A hemolytic streptococci are agglutinated by the serums of a considerable number of patients with peripheral rheumatoid arthritis. This is a difficult procedure technically and is impractical as a routine laboratory measure. If available, however, it is a valuable aid in diagnosis, as the agglutination is rather specific, with few false positive reactions. The agglutination of sensitized sheep cells in many instances follows the pattern of the Streptococcus agglutination and is technically a simpler procedure to carry out. The antistreptolysin-O titer is not elevated in rheumatoid arthritis in a greater number of instances than in the general population. The serum uric acid is usually within normal limits. The synovial fluid tends to be turbid and to clot, with an increased number of white blood cells and polymorphonuclears. Ropes and Bauer as well as Comroe have described the synovial fluid findings in detail.[4]

ROENTGENOLOGIC OBSERVATIONS

The roentgenologic picture varies greatly in different stages of rheumatoid arthritis and for convenience the early and late stages are described separately.

Early Roentgenologic Observations. — Early in the disease there may be no roentgenologic abnormalities, but gradually characteristic changes appear. In addition to the evidence of intracapsular effusion and of periarticular soft tissue swelling, the most uniform of these is a generalized demineralization. As a result of the superimposed factor of disuse, the demineralization usually appears more prominently in the region of the affected articulations, but all the bones in the body participate in the process. There may be narrowing of joint spaces and spotty marginal resorption of bone. Cortical destruction of the metatarsal heads may appear rather early.

Late Roentgenologic Observations. — As the disease progresses, destruction of cartilage with narrowing of the joint space occurs and small areas of cortical erosion appear. These small areas of atrophic bone destruction, often referred to as "punched-out areas," are a prominent feature of rheumatoid arthritis as well as of gout. In advanced cases the articular surfaces may become fused through fibrous or bony ankylosis. Not infrequently there may be subluxations or dislocations, with or without destruction of the ends of the bones. Coincidentally with these changes there may occur some degree of bone production, lipping, and osteophyte formation. These develop relatively late in the disease, however, and are evidences of degenerative joint disease secondary to the rheumatoid arthritis. In rare instances, complete loss of the ends of bone may occur, leading to the so-called "carpet-tack" deformity.

DIAGNOSIS

Criteria for diagnosis of rheumatoid arthritis have now been well established, and it is possible to distinguish this disease in most instances from other forms of arthritis. From the clinical picture and the laboratory aids, the typical case offers but little difficulty in diagnosis, and only the early or atypical case will cause trouble.

Differential Diagnosis.—Degenerative Joint Disease: The differentiation between rheumatoid arthritis and degenerative joint disease is important, since numerically these two groups account for approximately two-thirds of all cases of chronic arthritis and there is a great difference in their prognosis and treatment. Rheumatoid arthritis is a systemic disease, and the patients are ill. In degenerative joint disease, the patients are usually well save for their joint complaints; muscular weakness and atrophy and cutaneous changes are usually absent; weight-bearing joints and the terminal interphalangeal joints are more frequently involved; subcutaneous nodules are absent; serologic reactions, which are positive in rheumatoid arthritis, are negative, and the erythrocyte sedimentation rate is slightly, if at all, rapid. Osteoporosis and ankylosis are not seen on roentgenograms. The differential diagnoses between rheumatoid arthritis and rheumatic fever, gout, tuberculous arthritis, or pyogenic arthritis are discussed under the separate headings.

Variants of Rheumatoid Arthritis. — The following four syndromes, while called by other names, cannot be clearly separated from rheumatoid arthritis. Until a clear-cut pathogenesis is established, they will probably be classified by most observers under the general heading of rheumatoid arthritis, although it is recommended that their other designations be shown also.

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4. (*a*) Ropes, M. W., and Bauer, W.: Synovial Fluid Changes in Joint Disease, New York, The Commonwealth Fund, 1953. (*b*) Comroe.[24]

Still's Disease: Still's disease is a term applied to juvenile rheumatoid arthritis. The joints have the same appearance as in rheumatoid arthritis and there may be typical subcutaneous nodules; as a rule the Streptococcus agglutination test is negative. Changes in growth of bones about inflamed joints are frequently observed, and involvement of the cervical spine is not uncommon.

Felty's Syndrome: The term Felty's syndrome has been applied to patients with rheumatoid arthritis and hepatomegaly, splenomegaly, and leukopenia. These patients usually have severe disease. This syndrome also has been called rheumatoid arthritis with hypersplenism.

Psoriatic Arthritis: Psoriasis occurs in about 3% of patients with typical rheumatoid arthritis. This probably indicates a tendency for these two diseases to coexist. There are certain instances of psoriasis in which arthritic changes appear in the terminal interphalangeal joint of the fingers showing psoriatic nail lesions. These may represent a distinct form of arthritis, but at present the question remains open.

Rheumatoid Spondylitis: The syndrome of rheumatoid spondylitis, which is known also as ankylosing spondylitis, Marie-Strümpell arthritis, von Bechterew arthritis, spondylitis ankylopoietica, and spondylitis rhizomelique, is regarded by many as rheumatoid arthritis of the spine, though the relationship is not clear and it may be a separate entity. Since 20% of these patients have changes in peripheral joints indistinguishable from those seen in classical rheumatoid arthritis, it has been suggested that this syndrome may merely be a special form of the latter disease. There are dissimilar features. The sex ratio is 9 or more males to 1 female, in sharp contrast to typical rheumatoid arthritis. The response to certain therapeutic measures is different also, for these patients fail to respond to chrysotherapy but do, on the other hand, receive considerable benefit from roentgen therapy. In addition, the result of the hemolytic Streptococcus agglutination and sensitized sheep cell tests are almost always negative in patients with spondylitis. The roentgen picture is characterized by narrowing and poor definition of the articular margins of the sacroiliac joints, of the lateral articulations (apophyseal joints) of the spine, and of the costovertebral joints. Demineralization of the vertebral bodies and calcification of the lateral spinal ligaments give the characteristic roentgen picture of the "bamboo spine," but this is a fairly late finding.

Several possible variants of rheumatoid arthritis are discussed under miscellaneous forms of arthritis. These variants are intermittant hydrarthrosis, palindromic rheumatism, and Reiter's disease.

PROGNOSIS

In spite of the vast amount of crippling and deformity to which rheumatoid arthritis leads, the prognosis is by no means as unfavorable as is generally supposed. It is not sufficiently appreciated that a certain proportion of patients recover more or less completely, regardless of therapy. More frequently, the process becomes arrested or quiescent at some stage in its course and the patient is able to carry on activities with minimal handicap. In a smaller proportion, the disease pursues a cruel and inexorable course, leaving the patient severely crippled. It is impossible to forecast the turn of events in an individual patient. In the most favorable, a severe relapse may occur at any time, while, on the other hand, the most malignant example of the disease suddenly may become arrested.

Few accurate statistics on the natural course of the disease are available, but, in one series, over a 5 to 10 year period 15% were found to be in remission, 38% were improved, 13% were unchanged, and 34% were worse. Of the patients who had had the disease for more than one year, only 5% were in remission and 50% were stationary or worse. In this same report severe extensive disease was the most important single sign of a poor prognosis. Of no importance in the ultimate prognosis were such things as prodromal symptoms, acuteness of onset, and the presence of anemia.

TREATMENT OF RHEUMATOID ARTHRITIS

Despite the lack of a specific cure, it is often possible to control the disease or ameliorate its manifestations. Since rheumatoid arthritis is a systemic disease, the patient must be treated as a whole rather than with local therapy to the joints alone. Certain factors need consideration in evaluation of results of therapy: 1. The disease is subject to spontaneous relapses and remissions. 2. Certain patients recover fairly quickly, and the last therapy used is apt to be given the credit. A critical appraisal of a therapeutic agent in this disease requires several years of observation.

Realizing the difficulty of evaluating therapeutic claims, one should not be dogmatic in assessing the value of any single measure. In general, however, the therapeutic agents used in rheumatoid arthritis may be divided into four groups: (1) measures of proved value, (2) measures on which there is fairly uniform agreement but not complete unanimity, (3) measures that are of doubtful value or useless, and (4) measures so recently introduced that a fair appraisal is not possible.

Measures of Proved Value. — Measures of proved value, for the most part, are directed toward improving the patient's general health. (*a*) Rest: Rest is probably the most important single measure in the treatment of this disease—rest for the body as a whole and rest for the inflamed joints in particular. In prescribing rest, however, intelligence and insight are necessary. The amount of rest varies from confinement in a hospital for six weeks to one year for the patient with severe disease to a two hour daily rest period when the disease is mild. Rest must be regulated carefully. It is never necessary to prescribe absolute bed rest. Even with the severest disease, mild muscle setting exercises should be prescribed and should be increased as the patient improves. Each patient must be considered on his merits. For localized rest, suitable splints of the "gutter" type are of great assistance.

(*b*) Nutrition and General Hygiene: The majority of patients are underweight, undernourished, and chronically ill. Every effort should therefore be made to maintain their nutrition in the best possible state. A well-balanced diet of appetizing food is essential. All measures for improving the patient's general health should be encouraged. These include correct bowel function, dental care, and removal of obvious foci of infection. The removal of an infected focus will not alter the course of rheumatoid arthritis, and extraction of

teeth, tonsils, gallbladders, and pelvic organs should be undertaken only when removal would be indicated if the patient did not have arthritis. Indeed, wholesale removal of teeth usually is not only useless but actually harmful to the patient through interference with nutrition.

(*c*) Drugs: Salicylates are invaluable for the relief of pain. Occasionally it is necessary to resort to other drugs, such as barbiturates, for rest and sleep, and small amounts of codeine for brief periods of time. Addicting drugs such as morphine should be avoided, as they should in all chronic disease.

(*d*) Prevention and Correction of Deformities: In no disorder of the joints is the prevention of deformities of greater moment. The deformities are often due to neglect and, to a great extent, may be prevented by the skillful use of splints. For the prevention and correction of hand deformities, light aluminum splints are usually used, but for other joints deep "gutter" splints of plaster are preferable. These are worn only part of each day and at night in most instances, although for the correction of existing contractures continuous use is sometimes advisable for short periods. In rheumatoid spondylitis, a suitable brace during the day and a plaster shell to sleep in may prevent the spine from becoming rigid in a faulty position. In general, when stiffness and pain are severe, weight-bearing should be restricted. When weight-bearing is allowed, shoes that give some support should be prescribed and worn consistently. Loose slippers are to be avoided. When flexion contractures have occurred, active and passive exercises in conjunction with repeated plaster casts made in increasing extension may help to correct the contracture. If ankylosis is to be the end result, it is of the utmost importance that the affected joint become ankylosed in the optimal position for use. The knee should be extended to 180 degrees; the hip in straight position; the wrist in mid-dorsal flexion half way between pronation and supination; and the elbow flexed at about 90 degrees. When deformities due to ankylosis have occurred, surgical measures may be of great value. Such surgical procedures should be done when the activity of the disease has subsided.

(*e*) Physical Therapy: Physical therapy is a valuable adjunct in the treatment of many types of arthritis. The purposes of physical therapy are the relief of pain, the maintenance of normal ranges of motion in involved joints, and the maintenance of muscle power. Heat is the most frequently employed physiotherapeutic agent. Since the use of physical therapy is primarily a prophylactic measure, it must be carried out over an indefinite period of time. The simplest types of therapy that may be adapted to home use are preferable. Hot packing, hot and cold contrast baths, wax baths, infra-red or luminous heat lamps, or warm tub baths are among the simplest measures. Following the daily application of heat in the home, exercises should be carried out to attempt to prevent deformities or muscle wasting about involved joints. The success of a physical therapy program depends upon the patient's understanding of its prophylactic value, on precise instruction of the patient in the proper techniques for applying the measures, and detailed instruction in the type and extent of exercising to be done. Obviously, physical therapy cannot be given in "courses," since it has no curative value. Strenuous procedures such as Swedish massage, sweat cabinets, enervating baths, and violent exercises are to be avoided because of their possible deleterious effects. Occupational therapy may also be of great assistance in awakening the patient's interest in exercising involved joints and muscles.

(*f*) Psychotherapy: The importance of psychic factors in this disease is great but has not been clearly defined. It is apparent, however, that the attitude of the physician to the patient is most important. Encouragement to the patient and an optimistic interest in his illness will often help him to continue his regimen of treatment, whereas the reverse attitude will permit the patient to sit back and allow deformities to develop.

(*g*) Rehabilitation: The training of crippled patients to make the greatest use of their limited capacities is important in the severely disabled.

Measures on Which There is Fairly Uniform Agreement but Not Complete Unanimity.—(*a*) Chrysotherapy in Rheumatoid Arthritis of Peripheral Joints: The problem of the efficacy of gold therapy in rheumatoid arthritis continues to be a vexing one. In general, one may say that many believe that gold compounds are beneficial in the disease, but that the effect is temporary and the long-term course of the disease has not been modified by their use. In Europe, particularly in Scandanavia, the reports of beneficial effects are more impressive than in the United States. The mechanism of action of chrysotherapy is not understood. Even the most enthusiastic proponents of gold, however, recognize its limitations, which are as follows: 1. Gold is a toxic drug. Severe toxic reactions occur in from 10 to 20% of patients. Fatalities occurred when gold was first used but, with the precautions now observed, deaths from gold are extremely rare at present. 2. Gold does not benefit a considerable number of patients with rheumatoid arthritis. 3. The beneficial effects of gold are temporary, and relapses eventually occur after its use has been stopped.

Toxic reactions ascribed to gold in the past included almost every system in the body, but it is now generally agreed that these reactions fall into four categories: (1) cutaneous, varying from mild pruritus to fatal exfoliative dermatitis; (2) hemopoietic, with depression of one or more elements, agranulocytosis, thrombocytopenia, or aplastic anemia; (3) renal, varying from mild albuminuria to heavy metal type of nephrosis, and (4) mucous membrane, including stomatitis, gastritis, and colitis.

Considerable discussion continues concerning the hepatotoxic role of gold. This has been confused by the prevalence of homologous serum jaundice possibly introduced by contaminated needles or by a transfusion given concurrently with gold. Some authorities, however maintain that gold is a hepatic poison, and evidence of hepatic damage should be searched for when a patient is receiving gold.

Toxic reactions may be prevented to a limited extent by care on the part of the physician. With the use of smaller doses (never above 50 mg. of the compound at a time), the incidence of renal and mucous membrane complications has decreased markedly. Urinalysis every week or two during the course of treatment with gold may help to avoid a serious reaction. When albuminuria appears, gold therapy should be stopped. Fewer blood dyscrasias have been seen following the use of the smaller

doses as well, but these still occur. White blood cell counts with differential counts and estimation of the number of platelets on the smear should be done every week or two to detect the earliest evidence of a toxic reaction. These reactions, however, may appear suddenly, and it is impossible to predict them. Manifestations of skin toxicity are usually preceded by pruritus, but they, too, may appear without warning. A rash appearing during the course of gold therapy should be considered a toxic reaction to gold. At the first sign of leukopenia, thrombocytopenia with or without purpura, or pruritus, gold therapy should be stopped. The cessation of gold therapy, although essential, is often of little value, since the gold injected remains in the tissues for long periods and may be detected in the urine 10 months after the last injection. Reports on the use of dimercaprol (BAL) in the treatment of gold toxicity have been encouraging, and in a severe reaction this drug should be used. The skin complications of chrysotherapy may be controlled completely by the administration of cortisone, but one must be prepared to continue the cortisone during the natural course of the toxic reaction, which may continue for up to 12 to 15 months. If a severe toxic reaction develops, gold should not be administered again.

Because at some time almost all patients who have been benefited by gold relapse after the gold therapy is stopped, the original method of treatment has been supplemented in almost all clinics by that of maintenance dosage whereby administration of gold is continued indefinitely at intervals of two to four weeks. The efficacy of this method in preventing relapses has yet to be established. Detailed schedules of treatment have been given by Comroe.[2d] No physician should use this form of therapy without a more thorough study than can be presented in this Primer.

Conflicting reports have appeared concerning the value of the administration of gold concurrently with cortisone or corticotropin. It is certain that a patient who has failed to respond to gold will not do so after a course of cortisone or corticotropin. It has been suggested that the concurrent administration may prevent the beneficial effects of gold as well as counteract its toxic effects.

(*b*) Roentgen Therapy in Rheumatoid (Marie-Strümpell) Spondylitis: Roentgen therapy, when combined with general care, proper exercises, and the preservation of an erect posture, by braces if necessary, will cause a symptomatic remission in over 80% of patients with rheumatoid spondylitis. This is characterized by decrease in pain and stiffness and increase in mobility of the spine. It is of interest that although the patients have relatively few subjective symptoms of pain and stiffness, roentgenologic changes and increasing rigidity of the spine continue to progress. In other types of arthritis, little or no beneficial effect has followed x-ray therapy.

(*c*) Climate: Well-controlled studies have not been made on the incidence of rheumatoid arthritis in various parts of the United States or on the effects of climate on the established disease. Patients with rheumatoid arthritis may prefer to avoid the northern winters when economic and other factors do not make such a move a great hardship. The therapeutic value of such a move is questionable, particularly when a program of therapy might be interrupted.

Measures That Are of Doubtful Value or Useless.—The following measures belong in the category of measures of doubtful value or known to be useless and cannot be recommended: (*a*) vaccine therapy, (*b*) foreign protein therapy, (*c*) administration of vitamins, including vitamin D, in massive doses, (*d*) use of drugs as specific therapy, (*e*) endocrine preparations, (*f*) dietary fads, (*g*) fever therapy, (*h*) administration of sulfur, (*i*) bee venom therapy, (*j*) use of sulfonamide derivatives, (*k*) use of antibiotics, (*l*) treatment with antireticulocytotoxic serum, (*m*) transfusions of whole blood, and (*n*) administration of postpartum plasma.

The value of vaccine therapy remains unproved. The value of foreign protein injections in the form of milk, typhoid vaccine, and the like has not been definitely proved. Fever therapy is followed by only temporary improvement, and few patients with rheumatoid arthritis can tolerate such a rigorous procedure. At the present time, therapy with large doses of vitamin D should be regarded as of doubtful value, with definite potentialities for harm. There are no specific drugs for rheumatoid arthritis. Optimistic reports of use of dietary fads, colloidal sulfur, antibiotics, and postpartum plasma have not been substantiated. Injections of bee venom are of no value. Sulfonamide compounds and penicillin have been useless. Bogomolets' antireticulocytotoxic serum has proved worthless in rheumatoid arthritis. The efficacy of repeated transfusions of whole blood is not established, and the danger of homologous serum jaundice from such a regimen is obvious.

Measures Recently Introduced.—(*a*) Cortisone and Corticotropin: The use of cortisone and corticotropin in the rheumatic diseases is the major topic to be discussed under this heading. General principles may be set down in this section for many of the diseases discussed in this Primer, including rheumatoid arthritis, rheumatic fever, lupus erythematosus disseminatus, periarteritis nodosa, and gout. The action of these hormones is probably an anti-inflammatory one, counteracting many types of inflammation caused by diverse agents, and benefit is apparently dependent on the production of some measure of the hyperadrenal state for a degree of benefit. In view of the natural history of Cushing's syndrome—a disease that is rather lethal—the production of the hyperadrenal state must be minimized during prolonged treatment. When the natural history of the various rheumatic diseases is considered, it becomes apparent that in some, such as most instances of rheumatoid arthritis, sustained hormonal administration is required; in others, such as acute gout or rheumatic fever, the disease pattern is self-limited and relatively short courses of therapy may be undertaken with reasonable hope of success. One further element must be considered and that is a post-treatment exacerbation whereby the disease assumes greater activity for a variable period of time following hormonal withdrawal than before treatment.

With these theoretical points in mind, one may consider the use of these hormones with particular reference to rheumatoid arthritis.

There is almost no disagreement that the symptoms and signs of disease activity and of inflammation decrease

promptly following the administration of these hormones in large doses. The degree of subsidence depends on two factors: (1) the extent of inflammation and (2) the amount of hormone administered. In almost every instance, some degree of benefit to the patient follows the administration of these hormones. With continued high dosage and the complete suppression of disease, manifestations of Cushing's syndrome rapidly make their appearance. Among the commonest have been hypertension, glycosuria and hyperglycemia, hypokalemia and muscle weakness, reactivation of latent infection such as pulmonary tuberculosis, failure on the part of the patient to manage an intercurrent infection, psychotic episodes, and congestive heart failure due to sodium and water retention. When large doses are continued for long periods of time, demineralization and pathological fractures have been described.

For these reasons, the employment of large doses to achieve a complete suppressive effect has largely been abandoned in rheumatoid arthritis, and smaller amounts of hormone have been administered to achieve a partial suppression. Since in only 10 to 15% of patients with rheumatoid arthritis is a sustained remission seen following withdrawal and also since the rebound phenomenon is probably real, continued hormonal administration should be contemplated in most instances. The indications for the use of these hormones in rheumatoid arthritis are not too clearly defined, but the opinion of many now is that such therapy should be started as a calculated risk when the disease is doing poorly with other agents and progressing rapidly. Certain contraindications do exist, such as pulmonary tuberculosis, severe diabetes mellitus, and severe hypertensive vascular disease. Other contraindications are less absolute but should give one pause, such as the postmenopausal state, a bedridden patient with severe disease in whom ambulation is unlikely, or a history of a peptic ulcer. The cost of the hormones has been markedly decreased in the past four years, but still is formidable since careful medical supervision including laboratory fees must be added to the cost of medication.

There is apparently little difference between corticotropin and cortisone in their effects in the rheumatic diseases. Oral administration of cortisone is simpler for the patient, but the fear of temporary adrenal atrophy and the dangers of sudden withdrawal with adrenal insufficiency exist with cortisone but not with corticotropin. Hydrocortisone (compound F) given orally has almost the same effects as cortisone in the long-term management of rheumatoid arthritis.

Hydrocortisone acetate is effective locally when given intra-articularly, whereas cortisone acetate is rarely so. The drawbacks to the use of the former in rheumatoid arthritis are that the effect is temporary, that an exacerbation in the joint may occasionally follow the beneficial effect, and that repeated intra-articular injections are difficult in the long-term management of this disease. The hormone may, however, prove to be a valuable adjunct in the care of the patient with rheumatoid arthritis in whom one or two joints are active.

No absolute treatment schedules can be outlined in this Primer, but certain general statements can be made. The indications for the use of these hormones depend on a careful assessment of the disease in the patient in relation to his environment as well as a period of observation to see the direction in which the disease is progressing. There are certain definite contraindications. The aim of therapy is to minimize the hyperadrenalism produced and yet to exert some beneficial effect on the inflammatory aspects of the disease under treatment. The amount of hormone administered should be kept at the lowest level, with the hope of a sustained remission and eventual hormone withdrawal uppermost in the mind of the physician. No one knows how long it is feasible to continue use of the hormones. A few patients have been receiving corticotropin or cortisone continuously for over three years. Our clinical experience goes no further than that. The hormones should be used in conjunction with salicylates and the other measures of proved value.

(*b*) Phenylbutazone: In the past two years, phenylbutazone has been used rather widely as an anti-inflammatory agent in the United States. It is an effective agent, often providing symptomatic relief, but has produced certain toxic reactions such as salt and water retention, gastric irritation, and granulocytopenia.

THE COLLAGEN DISEASES

The concept of the diffuse collagen diseases as comprising a group of clinical entities of unknown and probably diverse pathogenesis but with common histological changes has arisen in recent years. This classification is an anatomical one and involves no pathogenetic implications. This group, strictly speaking, includes only lupus erythematosus disseminatus, periarteritis nodosa, scleroderma, and dermatomyositis, but in the minds of some persons has been used to include serum sickness, erythema nodosum, rheumatoid arthritis, and rheumatic fever as well. In most instances each syndrome manifests itself by a relatively specific pattern. Within this group of diseases, however, there are occasional patients in whom several clinical patterns are merged to the extent that a definitive diagnosis is impossible. These conditions have been called "undifferentiated collagen disease." In some patients, a diagnosis may be established by continued observation; in others only at postmortem examination; and in a few, a final diagnosis cannot be reached even after a careful and complete autopsy.

Pathologically, these diseases show general alteration of the connective tissue involving varying components of cellular, fibrous, and intercellular elements. The implication that collagen itself is involved needs to be substantiated. The lesion that has been thought to be typical is fibrinoid degeneration or change, but this alteration is seen following simple mechanical trauma to skin, in the base of peptic ulcers, and in the Arthus phenomenon.

It has been suggested that there is an element of hypersensitivity in the etiology of these diseases. The experimental production in animals of arterial lesions resembling those of periarteritis nodosa following the administration of foreign proteins and the history of hypersensitivity in these patients to sulfonamides, horse serum, certain vaccines, and even simple chemicals has been offered as evidence to support this thesis.

It is frequently observed on the other hand that patients with one of the collagen diseases give no prior history of hypersensitivity. At this time, there is only suggestive evidence to support the conclusion that hypersensitivity is the underlying basis of these diseases.

It is important to note that, although these diseases may show common pathological findings microscopically, this in no way implies a common cause. It may be that connective tissue responds to a host of noxious stimuli only in a limited number of nonspecific reactions, i. e., necrosis, fibrinoid change, cellular infiltration, proliferation, and/or sclerosis.

Lupus erythematosus disseminatus, periarteritis nodosa, scleroderma, dermatomyositis, and erythema nodosum will be described in some detail, since the arthritic, arthralgic, or myositic symptoms associated with them must be differentiated from rheumatoid arthritis.

LUPUS ERYTHEMATOSUS DISSEMINATUS

Lupus erythematosus disseminatus is a generalized systemic disease with varied manifestations. It occurs in females in 85% of cases. The course is variable, with remissions and exacerbations, but usually terminates fatally; however, some 20% of patients with this disease are alive five or more years after onset.

Etiology.—The cause is unknown, but the onset of disease has been at times associated with excessive exposure to sunlight, ultraviolet light from any source including photographic light, trauma, x-ray irradiation, therapy with a gold compound, or specific sensitivities.

Pathology.—At autopsy, gross findings are frequently minimal and the histological changes are those involving the cellular, fibrillar, and ground substance elements of the connective tissue. Lesions may be widespread, with fibrinoid change, focal increase in metachromasia, and reactive cellular infiltration. There is a predilection for involvement of the serous membranes (pleural, pericardial, peritoneal, and synovial). Nonverrucous endocarditis has been reported frequently (10 to 55%), as has focal myocarditis (35%). Wire loop changes (thickening of glomerular capillary basement membranes) and focal glomerular loop necrosis are the prominent renal findings, and onion skin lesions (lamellar periarterial fibrosis) are found in the spleen. Involved skin may show dilatation of vessels, edema of the upper layer of the corium, swelling of ground substance between fibrils, and focal alteration of the collagenous connective tissue with fibrinoid degeneration. Hematoxylin bodies (depolymerized desoxyribonucleic acid) are found in all mesenchymal organs, most frequently the kidneys and endocardium, and are considered to be specific for lupus erythematosus disseminatus.

Clinical Features.—The disease is erratic in course but usually at onset will be manifested by irregular elevations of temperature, malaise, weight loss, arthralgias, arthritis, Raynaud's phenomena, or edema (periorbital or peripheral). Not infrequently, the onset has been recorded as thrombocytopenic purpura or hemolytic anemia.

Joint involvement is noted in this disease in more than 75% of the patients. Migratory arthralgias are most frequently seen, with permanent clinical or x-ray evidence of arthritis present in only 35% of patients. The diagnosis is one that is commonly made following a period of fairly prolonged observation and may be based on a combination of the findings of cachexia, fever and weight loss, arthralgia or arthritis, cardiac and renal involvement, polyserositis (pericarditis, pleuritis, peritonitis with or without effusion), skin rash, possibly occurring as a typical butterfly eruption, generalized adenopathy, and hepatomegaly or splenomegaly. Hypertension, local vasomotor disturbances, neurologic manifestations, and eyeground changes are sometimes observed. These symptoms and signs associated with anemia, leukopenia, thrombocytopenia, albuminuria, and an abnormal urinary sediment in the absence of a positive blood culture lead to the presumptive diagnosis of lupus erythematosus disseminatus. Additional positive laboratory data may be nonspecific electrocardiographic changes, x-ray evidence of abnormalities of the chest such as pleurisy with or without effusion and pericardial effusion, elevated serum globulin with or without associated decreased albumin, and biological false positive serologic tests for syphilis.

The presence of a positive LE cell preparation on tests of the blood lends credence to the diagnosis, since false positive results have rarely been reported. It has, however, been negative in proved lupus erythematosus disseminatus. In the early stages of the disease, it is often difficult to distinguish from rheumatoid arthritis, but the presence of multiple system involvement favors the diagnosis of lupus erythematosus.

Treatment. — No therapy prior to the advent of corticotropin and cortisone has been shown to be of value in the treatment of this disease, although salicylates have been helpful in some instances. At present, although it can be stated that the use of these agents causes marked amelioration of the symptoms and signs of the disease, no definitive statement can as yet be made as to the effect of this treatment on the ultimate course of lupus erythematosus disseminatus. In sustained therapy with hormones, the same principles apply as in rheumatoid arthritis.

DERMATOMYOSITIS

Dermatomyositis is a systemic disease in which skin, subcutaneous tissues, skeletal muscles, and occasionally viscera are the sites of nonsuppurative inflammation, usually chronic in nature. Although generally considered to be a distinct clinical entity, it has been regarded by some as a symptom syndrome related to a neoplasm.

Etiology. — The cause is unknown. As noted, a neoplasm has been found in some patients with dermatomyositis, with subsidence of symptoms on removal of the tumor.

Pathology.—The cutaneous, muscular, and visceral lesions of this disease, while not specific, are characteristic. Grossly, the skin shows thickening, edema, and induration; the muscles become swollen with yellow serous exudate. Histological changes are those of mild inflammation in the skin associated with atrophy. The skeletal muscles and subcutaneous tissues as well as other organs show nonspecific lesions with interstitial edema, focal degeneration, perivascular inflammation, and fibrosis. Increase in connective tissue with thickening of blood vessel walls has been described occasionally associated with thrombosis.

Clinical Features.—The onset of the disease is often insidious, with vague complaints of low-grade fever, extreme malaise, weight loss, vasomotor disturbances, muscular aching, and arthralgias. Firmness or bogginess to palpation, tenderness to superficial and deep pressure, and pain on motion of involved muscles are pronounced; marked muscle atrophy is seen, arthralgias are minimal, and joint deformities with flexion contractures develop late in the disease following skeletal muscle degeneration. Transient dysphagia, abdominal cramps, melena, hypertrichosis, diplopia, weakness of sphincter and facial muscles, generalized adenopathy, and splenomegaly have occasionally been reported. Dermatitis may be inconstant and transitory and varies, with dusky erythema, urticaria, and poikiloderma as the commoner manifestations. Butterfly eruption resembling that seen in lupus erythematosus, cutaneous edema, and calcification of skin and muscle have been reported. Periorbital edema and Raynaud's phenomena are not infrequently seen.

Diagnosis may be made in the presence of a combination of the above findings with an increase in erythrocyte sedimentation rate, increased creatinuria, eosinophilia (frequently present), and a compatible musculocutaneous biopsy. Less frequently noted positive laboratory findings are mild anemia, leukocytosis with increase in monocytes and lymphocytes, or mild albuminuria.

Treatment.—Therapy remains largely symptomatic. A wide variety of agents reportedly used with success includes testosterone propionate, amino acids, vitamins, para-aminobenzoic acid, and, most recently, corticotropin and cortisone. The two latter agents have afforded some symptomatic relief, but few prolonged remissions on withdrawal of these agents have been reported.

Prognosis.—Generally the prognosis is poor. Although prolonged spontaneous remissions and exacerbations of symptoms do occur, there are no *bona fide* cures reported. Death usually results from progressive involvement of the cardiac muscles or of the respiratory or deglutitory muscles, with terminal cardiac failure, secondary respiratory infection, and inanition.

SCLERODERMA

Scleroderma is a systemic disease seen in middle life. It affects females oftener than males. It is manifested primarily by changes in the collagenous connective tissues of the skin, subcutaneous tissues, and organs.

Etiology.—The cause is unknown. Infection, alteration in protein metabolism, sensitization, autonomic nervous system disturbances, and genetic faults have been suggested.

Pathology.—Grossly, the skin may be edematous, indurated, smooth, waxy, and tight, depending on the stage of the disease. Histologically, the stiffness and hardness of involved tissues is explained by focal fibrinoid degeneration and diffuse sclerosis of the intradermal and subcutaneous connective tissue. The earliest change consists of intercellular collagenous swelling, with subsequent sclerosis. Skin lesions may be diffuse or exist as an isolated patch (morphea). Pathological changes may resemble those of lupus erythematosus disseminatus, with focal fibrinoid change, necrosis, and intimal and fibrous proliferation. These changes may be widespread, involving the blood vessels, endocardial and subendocardial connective tissue, myocardium, lungs, and gastrointestinal tract (especially the esophagus).

Clinical Features.—Weakness, weight loss, and arthralgias may be prodromal symptoms of this disease. Characteristically, cutaneous involvement passes through several stages from brawny edema to a smooth, tight, waxy skin, which is not movable over the deeper tissues. Any cutaneous area may be involved; most frequently changes begin on the extremities, cheeks, and bridge of the nose, forehead, and chest. There may be slow progression to involve all the skin of the face and trunk. Raynaud's phenomena and sclerodactylia are frequent while arthralgia is less frequent, and diffuse calcinosis of the skin (Thibierge-Weissenbach syndrome) is uncommon. The end result of the disease is marked subcutaneous and muscle atrophy, thinning and tightening of the skin with a progressive decrease in joint motion. Marked brownish pigmentation of skin may develop, along with anhydrosis, loss of hair, and formation of indolent ulcers.

Visceral manifestations are frequent, with dysphagia (secondary to esophageal involvement), dyspnea, cyanosis (secondary to lung involvement), and heart block and heart failure (secondary to myocardial involvement). Restricted diaphragmatic motion may be noted clinically and fluoroscopically. Dental changes have been described, with widening of the peridontal space and disappearance of the lamina dura with and without the loosening of teeth. Cataracts have also been reported.

Laboratory data other than skin biopsy contribute little to the diagnosis of scleroderma. Creatinuria, hyperglobulinemia, hypoalbuminemia, and x-ray evidence of gastrointestinal tract involvement may support the diagnosis of scleroderma.

Treatment.—The wide variety of agents suggested for the therapy of this disease bespeaks their lack of efficacy in halting its progression. These have included general supportive measures, physical therapy, bismuth salts, testosterone, vitamin D, antihistaminics, procaine hydrochloride, vitamin B_{12}, and para-aminobenzoic acid. Variable results have followed the administration of cortisone and corticotropin, perhaps related to the stage of the disease in which they were used. Amelioration of the symptoms has sometimes been achieved in the early phase, but the fundamental course of the disease has not been altered.

Prognosis.—The prognosis for life is generally fair, and long-term remissions of the disease in various stages of progression are not infrequent. The multiplicity of organs that may be involved makes it apparent that cardiac, respiratory, gastrointestinal, genitourinary, or cutaneous phenomena may lead to severe morbidity. Death results as a sequel to the above noted system involvement.

PERIARTERITIS (POLYARTERITIS) NODOSA

Periarteritis nodosa is a systemic disease that is seen more commonly in middle-aged males than in females. It has extremely variable clinical manifestations, depending on the particular sites involved in the pathological process.

Etiology.—There is no known etiological agent in this disease. Reports of cases following sensitization to sul-

fonamides, desoxycorticosterone acetate, thiourea, organic arsenicals, iodine, propyl thiouracil, diphenylhydantoin (Dilantin) sodium, primrose, poison oak, Trichinella spiralis and concomitantly with ratbite fever suggest that hypersensitivity plays an important role. Experimentally, it is possible to produce lesions in animals resembling those of periarteritis nodosa by a variety of mechanisms, both allergic and nonallergic. It is, indeed, quite likely that a number of etiological agents may produce the end picture of the disease.

Pathology.—Pathological changes of this disease are directly ascribable to involvement of small and medium arteries throughout the body. Histologically, the early lesion is edema of the media and perivascular area, later followed by perivascular eosinophilic and polymorphonuclear inflammatory infiltrates. Finally, there is fibrinoid and hyaline degeneration of the vessel wall followed by reparative attempts with fibrosis especially of the adventitia. This proliferative stage may progress to healing, to vessel occlusion with infarction, or to aneurysm production. Varying states in the evolution of this lesion may be seen in the same person or even in the same vessel.

Clinical Features.—Elevation of temperature, malaise, fatigue, and anorexia are commonly present. Specific symptomatology is protean, depending on the vessels involved. The commonest features, however, are hypertension, gastrointestinal symptoms, peripheral neuritis, renal involvement, cardiac disease, and skin and skeletal muscle lesions. Pulmonary manifestations have been described, and it is possible that Loeffler's syndrome is a mild form of periarteritis nodosa. Asthmatic attacks have occurred as an early symptom, and at times the syndrome has appeared late in the course of chronic asthma. A large variety of cutaneous eruptions varying from erythematous through bullous forms have been reported. Arthritis is a relatively rare occurrence, but arthralgias associated with polyneuritis and myositis are not infrequently seen.

From the laboratory point of view, anemia, leukocytosis, eosinophilia, a markedly elevated sedimentation rate, and abnormal urinary findings support a diagnosis of periarteritis nodosa. Biopsy remains the sole means of confirming the diagnosis during life and is diagnostic in one-quarter to one-third of random biopsies in this disease.

Treatment.—Salicylates and antihistaminics are of no proved value in periarteritis nodosa. Corticotropin or cortisone may produce temporary remissions, but exacerbations usually follow drug withdrawal. During hormonal therapy, complications incident to healing of arterial lesions by fibrosis or aneurysmal change may occur.

Prognosis.—The prognosis of the patient with full-blown periarteritis nodosa is poor, with death the usual outcome after a relatively short course. There is a possibility that mild and self-limited examples of periarteritis nodosa may proceed to complete recovery if no vital organ is involved in the periarteritic process, which includes eosinophilic pneumonitis (Loeffler's syndrome) and the usual episode of penicillin sensitivity.

ERYTHEMA NODOSUM

Erythema nodosum is an erythematous cutaneous eruption manifested by the occurrence of deep discrete subcutaneous nodules usually limited to the extremities.

Etiology.—Erythema nodosum is currently believed to be a manifestation of hypersensitivity. The lesions have been seen in the course of tuberculosis (occasionally at the time the tuberculin test becomes positive), in the course of rheumatic fever, sarcoid, streptococcic sore throat, coccidioidomycosis, ulcerative colitis, and neoplasia, and following the use of iodides. Many instances of this syndrome, however, have no demonstrable basis of hypersensitivity.

Pathology.—The pathological lesion is an intense infiltration of the corium with tightly packed erythrocytes and leukocytes.

Clinical Features.—The nodules of erythema nodosum may appear after the use of various drugs or appear in the course of the diseases mentioned above. Arthralgia may occur prior to or following the appearance of the nodose lesions. The arthralgia may persist for a considerable length of time (up to six months), but final disappearance of this symptom is the rule.

Treatment.—No specific therapy is available or necessary, since both the nodose lesions and arthralgias are self-limited. Cortisone and corticotropin, however, if not contraindicated by the presence of active tuberculosis, have been helpful in controlling the acute symptoms at the height of the disease. Salicylates are useful.

(To Be Continued)

COUNCIL ON PHARMACY AND CHEMISTRY

REPORT OF THE COUNCIL

The Council has authorized publication of the following report.

R. T. STORMONT, M.D., *Secretary.*

REVISION OF N. N. R. STATEMENT ON TESTES

In the customary annual reconsideration of the text of New and Nonofficial Remedies it was pointed out to the Council that exaggerated and unwarranted claims are made for the use of these agents in the so-called male climacteric. In order to promote rational use and to establish reasonable limits to such claims the Council adopted the following paragraph to be inserted in the general statement on testes (N. N. R. 1952, p. 367):

"A spontaneous cessation of hormone release by the testis with aging has been recognized as a rare entity termed male climacteric or menopause. Symptoms are similar to those of the female menopause. In the vast majority of instances, the vague manifestations of a psychoneurosis are incorrectly confused with those of organic testicular disorder. Criteria for laboratory confirmation of the diagnosis of male climacteric are equally confused. At present, such diagnosis probably is not justified without the demonstration of castration levels of urinary gonadotropin, as in the female. Testosterone provides effective replacement therapy only in the true disorder."

The Council has hitherto accepted only preparations of testosterone propionate and methyl testosterone. As corollary to the preceding decision the Council voted also to consider preparations of free testosterone.

MEDICAL LICENSURE STATISTICS FOR 1952

FIFTY-FIRST ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Donald G. Anderson, M.D., Secretary, and Anne Tipner

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Statistical compilations regarding medical licensure are presented annually in the State Board Number of THE JOURNAL. The report for 1952 constitutes the 51st annual presentation. Data are included pertaining to (*a*) medical examining and licensing boards of the United States, the District of Columbia, and the territories and outlying possessions of the United States, (*b*) the boards of examiners in the basic sciences, and (*c*) the National Board of Medical Examiners.

The computations presented are based on official records received throughout the year from the medical examining and licensing agencies of all states, Alaska, Hawaii, Puerto Rico, the Canal Zone, and Guam. No physicians were licensed for civilian practice in the Virgin Islands in 1952. The figures for Connecticut and Maryland also include data reported by the homeopathic medical examining boards of those states. The homeopathic boards in Arkansas and Louisiana had no new licentiates last year. Data are also included pertaining to the 21 boards of examiners in the basic sciences and, lastly, the National Board of Medical Examiners. The Council and THE JOURNAL gratefully acknowledge their appreciation to those who have supplied these data as well as other records furnished throughout the year.

The tables referring to medical licensing present figures pertaining to the number of candidates examined, the numbers licensed, and the number who represent additions to the physician population. Data are also included pertaining to the regulations for medical licensure both of physicians who secured their professional training in the United States and Canada and of physicians educated in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL LICENSURE

Licenses Issued

In 1952, 13,228 licenses to practice medicine were issued by 54 boards authorized by law to grant licenses to practice the art and science of medicine. The number licensed by each of these boards by examination or by the endorsement of credentials is shown in table 1. Of the 13,228 licenses issued, 6,212 were granted after examination and 7,016 by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners.

TABLE 1.—*Licenses Issued, 1952*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	65	99	164
Arizona	14	72	86
Arkansas	79	56	135
California	451	1,130	1,581
Colorado	33	84	117
Connecticut	18	195	213
Delaware	17	21	38
District of Columbia	13	134	147
Florida	583	...	583
Georgia	149	80	229
Idaho	10	60	70
Illinois	503	146	649
Indiana	173	142	315
Iowa	94	90	184
Kansas	93	87	180
Kentucky	124	90	214
Louisiana	218	83	301
Maine	15	33	48
Maryland	238	156	394
Massachusetts	31	290	321
Michigan	219	180	399
Minnesota	220	131	351
Mississippi	84	50	134
Missouri	248	143	391
Montana	8	35	43
Nebraska	93	33	126
Nevada	...	16	16
New Hampshire	7	44	51
New Jersey	48	313	361
New Mexico	5	56	61
New York	301	991	1,292
North Carolina	141	151	292
North Dakota	24	15	39
Ohio	393	293	686
Oklahoma	66	65	131
Oregon	29	88	117
Pennsylvania	334	294	628
Rhode Island	32	30	62
South Carolina	64	58	122
South Dakota	13	20	33
Tennessee	209	94	303
Texas	318	291	609
Utah	26	49	75
Vermont	7	25	32
Virginia	128	111	239
Washington	58	129	187
West Virginia	18	76	94
Wisconsin	140	107	247
Wyoming	1	12	13
Alaska, Canal Zone, Guam, Hawaii and Puerto Rico	57	68	125
Totals	6,212	7,016	13,228

In the descriptive data reference is made to the total number of boards for which figures are reported. The figures include the examining and licensing boards in the territories and possessions and also the homeopathic boards.

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. of Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F
	ALABAMA																																												
1	Medical College of Alabama, Birmingham	45	0															8	0	2	0																					1	0		
	ARKANSAS																																												
2	University of Arkansas School of Medicine, Little Rock					79	0											4	0																										
	CALIFORNIA																																												
3	Coll. of Medical Evangelists, Loma Linda-Los Angeles							56	3	1	0							5	0															1	0			5	0			1	0	1	0
4	Univ. of So. California School of Med., Los Angeles			2	0			63	0	1	0																																
5	Stanford University School of Medicine, Stanford University-San Francisco							59	1																											1	0						
6	University of California School of Medicine, San Francisco							67	0									1	0																					1	0		
	COLORADO																																												
7	University of Colorado School of Medicine, Denver			1	0			2	1	57	0													4	0	1	0	1	0					1	0								
	CONNECTICUT																																												
8	Yale University School of Medicine, New Haven																	2	0					2	0									1	0								
	DISTRICT OF COLUMBIA																																											
9	Georgetown University School of Med., Washington							1	0	1	0					1	0	4	0																										
10	George Washington Univ. School of Med., Washington			1	0											1	0	4	0	1	0																			1	0	1	0
11	Howard University College of Medicine, Washington	1	0					2	1							5	0	3	1					1	0									2	0			16	0						
	GEORGIA																																												
12	Emory University School of Medicine, Atlanta (Emory University)																	23	2	62	0																								
13	Medical College of Georgia, Augusta																	15	0	75	0																								
	ILLINOIS																																												
14	Chicago Medical School							8	0									4	1					24	3	1	0													1	0		
15	Northwestern University Medical School, Chicago	1	0					9	0							1	0	9	0			2	0	75	6					2	0					1	0			6	0	15	0
16	Stritch School of Med. of Loyola University, Chicago							6	0									5	0			1	0	42	0	7	0													8	0		
17	University of Chicago, The School of Medicine							5	0	1	0							4	0					23	0					2	0			1	0					1	0	3	0	2	0
18	University of Illinois College of Medicine, Chicago							20	0	1	0			1	0			15	2					125	6			3	1					1	0					1	0	1	0		
	INDIANA																																												
19	Indiana University School of Medicine, Bloomington-Indianapolis																	13	2					5	1	14	4	1																	
	IOWA																																												
20	State University of Iowa College of Med., Iowa City			1	0			7	0	1	0							3	1											80	0									1	0	4	0
	KANSAS																																												
21	Univ. of Kansas School of Med., Lawrence-Kansas City							1	0																					79	4											2	0		
	KENTUCKY																																												
22	University of Louisville School of Med., Louisville																	10	3					2	0							88	0					1	0			1	0
	LOUISIANA																																												
23	Louisiana State Univ. School of Med., New Orleans																	3	1															93	0							7	0		
24	Tulane University of Louisiana School of Medicine, New Orleans	4	0					3	0									24	0	1	0													100	0							1	0	22	0
	MARYLAND																																												
25	Johns Hopkins University School of Med., Baltimore							1	0									9	1					1	0													66	0	1	0	3	0	2	0
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore							1	0			1	0	2	0			12	0					1	0													74	0			3	0		
	MASSACHUSETTS																																												
27	Boston University School of Medicine																	2	2																	1	0								
28	Harvard Medical School, Boston	3	0					7	0			1	0					8	0					2	0							1	0	1	0	1	0	2	0			2	0	1	0
29	Tufts College Medical School, Boston									1	0					1	0	5	1																	1	0			1	0				
	MICHIGAN																																												
30	University of Michigan Medical School, Ann Arbor							7	0	1	0			1	0			4	0							2	0													1	0	11	5	0	4	0
31	Wayne University College of Medicine, Detroit							3	0	1	0					1	0	5	0					1	1	1	0													61	0				
	MINNESOTA																																												
32	University of Minnesota Medical School, Minneapolis			1	0			4	0							2	0	4	0					2	0															1	0	11	2	0
	MISSOURI																																												
33	St. Louis University School of Medicine							3	0									8	1					4	0															1	0	11	4	0
34	Washington University School of Medicine, St. Louis							3	0									7	0					2	1															2	0	2	0	3	0
	NEBRASKA																																												
35	Creighton University School of Medicine, Omaha	1	0					21	0	1	0							2	0					1	0			29	1	1	0			2	0							1	0	4	0
36	University of Nebraska College of Medicine, Omaha							1	0									1	0					4	1																				
	NEW YORK																																												
37	Albany Medical College																																											1	0		
38	State University of New York College of Medicine at New York City, Brooklyn											1	0	0	1			5	1															1	0			2	0			1	0		
39	University of Buffalo School of Medicine																	4	2	1	0																			2	0	1	0		
40	Columbia University College of Physicians and Surgeons, New York							3	0									7	0																					1	0				
41	Cornell University Medical College, New York			1	0			2	0									4	2							1	0			1	0	1	0	1	0			2	0			1	0		
42	New York Medical College, Flower and Fifth Avenue Hospitals																	1	3					1	0							1	0												
43	New York University College of Medicine							3	0									10	1															2	0	1	0	1	0	1	0				
44	Univ. of Rochester School of Medicine and Dentistry							3	0	1	0													2	0							1	0					1	0	1	0			1	0
45	State University of New York at Syracuse College of Medicine							1	0	1	0	1	0	2	0			3	0																							2	0			1	0
	NORTH CAROLINA																																												
46	Duke University School of Medicine, Durham	2	0	1	0													18	1	1	0			1	0									2	0			1	0						
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem																	3	0															1	0	1	0								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																				

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Guam	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
3 0									1 0																			60	60	0	0.0	5	1
																1 0												84	84	0	0.0	3	2
	1 0	2 0				1 0					1 0				1 0								1 0			1 0		81	78	3	3.7	14	3
																							1 0					68	68	0	0.0	5	4
														1 0														62	61	1	1.6	3	5
																												69	69	0	0.0	3	6
													1 0				1 0											70	69	1	1.4	9	7
								1 0		1 0																		7	7	0	0.0	5	8
								1 1	1 0										1 1									12	10	2	16.7	7	9
								1 0											2 0									13	13	0	0.0	9	10
	3 0					1 0		0 1	1 0	0	1 0			2 0					1 0				1 0	1 0	1 0			53	50	3	5.7	16	11
3 0									1 0										1 0									92	90	2	2.2	5	12
																												90	90	0	0.0	2	13
	1 0					1 0		5 2						2 0										0 1	1 0			55	48	7	12.7	11	14
3 0	2 0				1 0		2 0	1 0	1 0	2 0	3 0			4 0					2 0	1 0			3 0	7 0		1 0		160	154	6	3.8	24	15
						1 0		2 0			8 0			1 0										6 0		1 0		88	88	0	0.0	12	16
	1 0	1 0						4 0		1 0				3 0										1 0		1 0		54	54	0	0.0	16	17
1 0	2 0							2 0		1 0	1 0								3 0				6 0	7 0				201	192	9	4.5	18	18
								2 0																				168	164	4	2.4	4	19
											1 0								2 0						3 0			104	103	1	1.0	10	20
								1 1																	1 0			89	84	5	5.6	5	21
									2 0																		2 0	109	106	3	5.5	7	22
7 0																												104	103	1	1.0	3	23
2 0								1 0											2 1								4 0	163	162	1	0.6	10	24
2 0									1 0					1 0					1 0				1 0				2 0	90	89	1	1.1	12	25
								12 0						5 0					2 0		1 0			1 0			1 0	116	116	0	0.0	13	26
																			1 0						1 0			7	5	2	28.6	4	27
2 0	1 0				1 0			1 0	7 0					1 0				1 0	2 0				2 0					46	46	0	0.0	19	28
															1 0			1 0	1 0						1 0			14	13	1	7.7	9	29
	1 0					1 0		1 1			2 0			1 0														142	141	1	0.7	13	30
						1 0		1 0						1 0														77	76	1	1.3	10	31
									2 0											1 0			1 0		2 0			132	132	0	0.0	11	32
114	0								1 0					4 1	1 0		1 0								2 0		1 0	142	140	2	1.4	11	33
87	0							2 0	3 0																		1 0	113	112	1	0.9	10	34
4 0	2 0	15 1																		1 0			5 0		1 0		3 0		92	90	2	2.2	16	35
		78 3							2 0																1 0			91	87	4	4.3	6	36
								1 0																				2	2	0	0.0	2	37
	1 0				1 0	1 0		2 0			1 0								2 0					1 0				21	19	2	9.5	13	38
								4 0			1 0																	15	13	2	13.3	6	39
								3 0						1 0					1 0								1 0	17	17	0	0.0	7	40
			1 0					14 1	2 0		3 0			1 0	1 0	1 0								1 0				41	38	3	7.3	17	41
											1 0																	7	4	3	42.9	4	42
	1 0	1 0						6 3						1 0					1 0					1 0				34	30	4	11.8	13	43
	1 0	1 0						7 1	1 0		2 0				1 0				2 0	1 0			1 0					27	26	1	3.7	15	44
						1 0		4 0						1 0		1 0											2 0	20	20	0	0.0	12	45
2 0								0 1	1 0										1 0									42	40	2	4.8	11	46
4 0								1 0	5 4	0	3 0																	67	67	0	0.0	7	47
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. of Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F
	OHIO																																												
48	**University of Cincinnati College of Medicine**																	10	0																							1	0		
49	**Western Reserve University School of Med., Cleveland**							1	0									4	0					2	0																		
50	**Ohio State University College of Medicine, Columbus**																	8	0					1	0					1	0												
	OKLAHOMA																																												
51	**Univ. of Oklahoma School of Med., Oklahoma City**																																	1	0								
	OREGON																																												
52	**University of Oregon Medical School, Portland**							15	0	2	0					1	0					1	0					1	0	1	0											1	0		
	PENNSYLVANIA																																												
53	**Hahnemann Med. Coll. and Hospital of Philadelphia**	1	0					3	0			1	0	1	0			5	3																							1	0		
54	**Jefferson Medical College of Philadelphia**							3	0	1	0	1	0	4	0			9	1			2	0			1	0											3	0	1	0	2	0	3	0
55	**Temple University School of Medicine, Philadelphia**							2	0	3	0			1	0			15	0	1	0			2	1	1	0							1	0					1	0	3	0
56	**Univ. of Pennsylvania School of Med., Philadelphia**	2	0					4	0	1	0			1	0			9	0									1	0											2	0	5	0
57	**Woman's Med. College of Pennsylvania, Philadelphia**	1	0					2	0															2	0	1	0																
58	**University of Pittsburgh School of Medicine**							4	0									8	0																			1	0					5	0
	SOUTH CAROLINA																																												
59	**Medical College of South Carolina, Charleston**																	2	0																										
	TENNESSEE																																												
60	**University of Tennessee College of Medicine, Memphis**											0	1					8	4															2	0			1	0			23	0
61	**Meharry Medical College, Nashville**							9	0					1	0			1	0					2	1	1	0					30	0	1	0			1	1			1	0
62	**Vanderbilt University School of Medicine, Nashville**	1	0															6	1	1	0																					2	0
	TEXAS																																												
63	**Southwestern Medical School of the University of Texas, Dallas**																																									1	0	1	0
64	**Baylor University College of Medicine, Houston**			1	0			1	0											1	0			1	0																	2	0
65	**University of Texas School of Medicine, Galveston**																	2	1			1	0																				
	UTAH																																												
66	**University of Utah College of Med., Salt Lake City**			3	0			6	0	2	0							1	0			1	0																			6	0	2	0
	VERMONT																																												
67	**University of Vermont College of Med., Burlington**									1	0	1	0	1	0			3	0																					1	0	1	1		
	VIRGINIA																																												
68	**University of Virginia Dept. of Med., Charlottesville**																	5	0					1	0																				
69	**Medical College of Virginia, Richmond**																	5	1																							1	0		
	WASHINGTON																																												
70	**University of Washington School of Medicine, Seattle**	1	0					3	0															1	0					1	0			1	0							2	0		
	WISCONSIN																																												
71	**University of Wisconsin Medical School, Madison**							12	0									4	2			1	0	10	0									1	0					2	0		
72	**Marquette University School of Medicine, Milwaukee**			1	0			6	0			1	2					6	2			1	0	3	0	1	0			1	0	1	0					1	0			4	0	9	0
	CANADA																																												
73	**University of Alberta Faculty of Medicine, Edmonton**							2	0									1	0					1	1																			4	0
74	**University of Manitoba Faculty of Med., Winnipeg**							3	0									1	0																							8	0
75	**Dalhousie University Faculty of Medicine, Halifax**							3	0			1	0					1	0					1	1	1	0									2	0					2	0
76	**Queen's University Faculty of Medicine, Kingston**																	1	0																							2	0
77	**University of Ottawa Faculty of Medicine**																							1	0																	2	0
78	**University of Western Ontario Faculty of Medicine, London**																											1	0			1	0									2	0	1	0
79	**University of Toronto Faculty of Medicine**							5	0															3	0	2	0			1	0			1	0	1	0	1	0			2	0	4	0
80	**McGill University Faculty of Medicine, Montreal**							4	0									3	0	1	0			1	0	1	0							1	0			2	0	2	0	1	0	2	0
81	**University of Montreal Faculty of Medicine**																																											1	0
82	**Laval University Faculty of Medicine, Quebec**													0	1			0	1																			1	1	1	0				
	OTHERS																																												
83	**Foreign Medical Faculties**	2	0	1	0			98	45	1	0	7	14	2	0	2	0	14	3	2	0			153	160	0	1	3	0	1	0					4	2	31	11	10	17	10	2	10	0
84	**Extinct Medical Schools**																	2	1																			0	1						
85	**Unapproved Medical Schools**																	7	3																					5	34				
86	**Schools of Osteopathy**	1	1							5	0	1	4													7	0													0	3				
87	**TOTALS**	67		14		79		609		85		38		19		15		473		149		10		693		175		120		97		124		218		18		226		86		248		220	
88	**Totals—Examined—Passed**	66		14		79		558		85		17		17		15		422		149		10		510		173		118		93		124		218		15		213		31		246		220	
89	**Totals—Examined—Failed**	1		0		0		51		0		21		2		0		51		0		0		183		2		2		4		0		0		3		13		55		2		0	
90	**Percentage Failed**	1.5		0.0		0.0		8.3		0.0		55.3		10.5		0.0		10.8		0.0		0.0		26.4		1.1		1.7		4.1		0.0		0.0		15.8		5.7		63.9		0.8		0.0	
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

P—Passed; F—Failed.

Physicians certified in a given year after written examination were not in all instances tested in that year. The licensing boards of 26 states, the District of Columbia, Alaska, Canal Zone, Hawaii, Puerto Rico, the Virgin Islands, and Guam require a year of internship for licensure. The candidate for medical licensure in some of these states is permitted to write the examination before or while serving an internship and, if he is successful, the license is issued on completion of the internship. Licenses are withheld in some states for other technicalities. In general, also, the licenses of physicians examined in December are dated and issued in the following year. Table 1, therefore, includes some data on physicians who were examined in 1951 and a few in previous years.

	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and Guam	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
									0 1	1 0	.. ..	85 2	.. ..										1 0	.. ..		5 0	.. ..		106	103	3	2.8	7	48
	3 0								1 0	3 0	.. ..	73 1	.. ..																88	87	1	1.1	7	49
									.. ..	.. ..	.. ..	83 0	.. ..																93	93	0	0.0	4	50
									.. ..	.. ..	.. ..	1 0	53 0	.. ..												2 0	.. ..		57	57	0	0.0	4	51
	1 0								.. ..	.. ..	.. ..	.. ..	.. ..	28 1	2 0	.. ..							6 0	.. ..	1 0	.. ..	1 0		62	61	1	1.6	13	52
							1 0	.. ..	2 1	.. ..	.. ..	1 0	.. ..	.. ..	8 0	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	32	28	4	12.5	13	53
	1 0						12 0	.. ..	2 1	3 0	.. ..	5 0	.. ..	.. ..	104 0	2 0	2 0	.. ..	.. ..	1 0	2 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	2 0	169	167	2	1.2	23	54
							2 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	30 0	.. ..	.. ..	.. ..	.. ..	1 0	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	70	69	1	1.4	16	55
	2 0						1 0	.. ..	1 0	8 0	.. ..	5 0	.. ..	.. ..	65 0	.. ..	1 0	.. ..	.. ..	1 0	1 0	.. ..	.. ..	.. ..	1 0	1 0	.. ..	2 0	114	114	0	0.0	18	56
							2 0	.. ..	1 0	.. ..	.. ..	2 0	.. ..	.. ..	8 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	21	21	0	0.0	10	57
	5 0								.. ..	.. ..	.. ..	1 0	.. ..	.. ..	68 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	90	89	1	1.1	7	58
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	56 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	58	58	0	0.0	2	59
									1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	149 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	189	184	5	2.6	7	60
23	0								2 1	3 0	.. ..	1 0	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	9 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	70	67	3	4.3	16	61
1 0	1 0						1 0	.. ..	1 1	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	43 0	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	61	59	2	3.2	9	62
2 0	1 0																																	
									1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	66 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	73	71	2	2.7	6	63
2 0	3 0								.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	75 5	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	93	88	5	5.4	11	64
									1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	86 4	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	97	92	5	5.2	6	65
							1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	16 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	40	40	0	0.0	11	66
							1 0	.. ..	2 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	7 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	21	19	2	9.5	11	67
									1 0	5 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	62 10	.. ..	2 0	.. ..	.. ..	2 0	89	79	10	11.2	8	68
									.. ..	3 0	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	76 11	.. ..	8 0	.. ..	.. ..	4 0	111	99	12	10.8	8	69
							2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	17 0	.. ..	.. ..	.. ..	.. ..	.. ..	30	30	0	0.0	10	70
									.. ..	1 0	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	47 0	.. ..	1 0	84	82	2	2.4	11	71
							2 0	.. ..	4 1	.. ..	.. ..	1 0	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	3 0	.. ..	.. ..	2 0	.. ..	48 0	.. ..	3 0	105	100	5	4.8	21	72
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9	8	1	11.1	4	73
									.. ..	.. ..	5 0	1 0	.. ..	.. ..	1 0	.. ..	.. ..	2 0	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	23	23	0	0.0	9	74
									1 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	14	13	1	7.2	8	75
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	4	4	0	0.0	3	76
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	2	77
	1 0								1 0	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	10	10	0	0.0	8	78
									4 1	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	29	28	1	3.4	13	79
									2 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	25	25	0	0.0	15	80
						0 1	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	5	2	3	60.0	4	81
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	3	3	50.0	5	82
	1 0	5 0	.. ..	.. ..	.. ..	2 1	3 6	1 0	171 256	4 0	6 1	34 25	.. ..	.. ..	6 2	23 1	.. ..	5 0	1 0	6 3	.. ..	.. ..	8 5	4 0	1 0	3 0	.. ..	13 5	1,208	648	560	46.3	37	83
									.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	1 0	.. ..	.. ..	.. ..	4	2	2	50.0	2	84
							11 0	.. ..	1 5	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8 0	.. ..	.. ..	60	16	44	73.3	6	85
									36 24	.. ..	.. ..	47 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	41 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	194	157	37	19.6	10	86
	83	238	8	97	0	9	54	3	610	141	26	401	53	30	338	33	64	15	204	337	26	9	178	58	19	150	1	60	7,028	...	...	....	..	87
	83	238	8	93	0	7	48	3	305	141	25	371	53	29	334	32	64	15	204	317	26	9	149	58	18	150	1	55	...	6,229	...	....	..	88
	0	0	0	4	0	2	6	0	305	0	1	30	0	1	4	1	0	0	0	20	0	0	29	0	1	0	0	5	...	...	799	....	..	89
	0.0	0.0	0.0	4.1	0.0	22.2	11.1	0.0	50.0	0.0	3.9	7.5	0.0	16.7	1.2	3.0	0.0	0.0	0.0	5.9	0.0	0.0	16.3	0.0	5.3	0.0	0.0	8.3	...	...	...	11.3	..	90
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

The figures presented in this table will not correspond with succeeding tables that deal entirely with physicians examined for licensure within the year 1952. In tables 12, 13, and 14 can be noted the number who secured their first license in 1952 and who thus represent additions to the medical profession in the United States and its territories and outlying possessions.

Of the 13,228 licenses to practice medicine and surgery issued in 1952, the greatest number 1,581 were issued in California. New York licensed 1,292 physicians, while more than 500 were registered in Florida, Illinois, Ohio, Pennsylvania, and Texas. Delaware, Maine, Montana, Nevada, North Dakota, South Dakota, Vermont, and Wyoming issued less than 50. The fewest

(13) were licensed in Wyoming. The increase in the number of licenses issued last year as compared with 1951 totaled 1,290, representing an increase of 499 by written examination and 791 by endorsement of credentials.

Totals of the physicians licensed for 17 previous years and for 1952, both by examination and reciprocity, are included in table 3. The variations shown for the years from 1936 to 1941, inclusive, were due to the increase

TABLE 3.—*Licenses Issued, 1935-1952*

	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
1951	5,713	6,225	11,938
1952	6,212	7,016	13,228
Totals	110,765	82,545	193,310

in the licensure of foreign-trained physicians. The increase in 1946 and the succeeding years were the result of the increase in the production of physicians under the accelerated program in medical schools, the mobility of physicians, and the licensure of foreign trained physicians. In the 18 year period from 1935 to 1952, 193,310 medical licenses have been issued, 110,765 after written examination and 82,545 by endorsement of credentials.

Candidates Examined

In table 2 are recorded data referring to applicants examined for medical licensure by 53 licensing boards.[1] For each board the number who passed and failed are given, the medical school of graduation, the percentage of failures for each school as well as each licensing board, and the number of states in which graduates of a given school were examined. Medical schools in the United States that are no longer in existence, foreign faculties of medicine, unapproved medical schools, and schools of osteopathy are not listed by name; but the numbers examined in these three categories are included following those for existing medical schools in the United States and Canada.

Throughout the last calendar year 7,028 candidates were examined, of whom 6,229 passed and 799 failed. The candidates represented graduates of 72 existing approved medical schools of the United States, 10 approved medical schools of Canada, two approved medical schools in the United States no longer in operation, 160 faculties of medicine, and 3 licensing corporations of other countries, 5 unapproved medical schools in the United States that are no longer in existence, and seven schools of osteopathy. Osteopaths who were granted the legal right to practice medicine, surgery, or both, by the medical examining boards are included in these statistics. Osteopaths in other states who were granted the privilege of special practice by other than medical examining boards are excluded from these compilations.

Examination and reciprocity meetings are scheduled at frequent intervals by licensing boards in most of the states to facilitate licensure and to enable physicians to commence practice without undue delay. Later in this study a tabulation is included giving the schedules for all states. The publication of the dates for examinations and reciprocity or endorsement meetings is a regular biweekly feature of THE JOURNAL.

Represented among the 7,028 examinees were 5,434 graduates of approved medical schools in the United States, of whom 2.7% failed; 128 graduates of approved schools in Canada, with 7% failures; 4 who were graduated from medical schools no longer operating, with 50% failures; 1,208 graduates of faculties of medicine located in countries other than the United States and Canada, 46.3% of whom failed; 60 graduates of unapproved medical schools in the United States, none of which are in existence, with 73.3% failures, and 194 graduates of schools of osteopathy, with 19.6% failures.

As in table 1, the 7,028 examinees do not represent an equal number of persons, since a candidate tested in more than one state in a calendar year is counted in each state. If a candidate failed more than once in a given state within the year, however, he is counted in that state as a single failure. Figures that show the number of individual licentiates added to the medical profession in 1952 are given in tables 12, 13, and 14.

The greatest number of graduates of any one school examined was 201, representing a state university, the University of Illinois College of Medicine. Of the graduates of this school, 131 were tested in Illinois and 70 in 17 other states. The greatest number examined from a private medical school was 169, representing Jefferson Medical College; they were tested in 23 states, including 104 who were examined in Pennsylvania where the school is located. Sixteen other schools had more than 100 of their graduates examined for medical licensure in 1952 as follows:

State and Municipal Universities	No. of Examinees	No. of States in Which Examinations Were Taken
Indiana University	168	4
State University of Iowa	104	10
University of Louisville	109	7
Louisiana State University	104	3
University of Maryland	116	13
University of Michigan	142	13
University of Minnesota	132	11
University of Cincinnati	106	7
University of Tennessee	189	7
Private Medical Schools		
Northwestern University	160	24
Tulane University	163	10
St. Louis University	142	11
Washington University	113	10
University of Pennsylvania	114	18
Medical College of Virginia	111	8
Marquette University	105	21

Albany Medical College with two examinees and Yale, Boston University, and the New York Medical College with seven examinees each had the fewest num-

1. Forty-eight state boards, the District of Columbia, Puerto Rico, Hawaii, Guam, and Alaska.

ber of applicants from schools in the United States for medical licensure by written examination before state boards. The majority of the graduates of these four schools are licensed by endorsement of the certificate of the National Board of Medical Examiners. This is also true of other schools with small numbers of examinees.

The following 23 schools had no failures among their graduates in medical licensing examinations last year:

	No. of Graduates Examined	No. of States in Which Examinations Were Taken
Medical College of Alabama	60	5
University of Arkansas	84	3
University of Southern California	68	5
University of California	69	3
Yale University	7	5
George Washington University	13	9
Medical College of Georgia	90	2
Stritch School of Medicine	88	12
University of Chicago	54	16
University of Maryland	116	13
Harvard Medical School	46	19
University of Minnesota	132	11
Albany Medical College	2	2
Columbia University	17	7
State University at Syracuse	20	12
Bowman Gray School of Medicine	67	7
Ohio State University	93	4
University of Oklahoma	57	4
University of Pennsylvania	114	18
Woman's Medical College	21	10
Medical College of South Carolina	58	2
University of Utah	40	11
University of Washington	30	10

Thirty-one schools had less than 5% and nine between 5 and 10% failures among their graduates. There were nine schools with 10% or more of failures in state examinations. The over-all figures and percentages for failures

TABLE 4.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1952*

	Examined	Passed	Failed
California	17	17	0
Connecticut	1	1	0
Delaware	1	0	1
Florida	8	7	1
Georgia	1	1	0
Illinois	9	7	2
Indiana	4	4	0
Iowa	1	1	0
Kansas	1	1	0
Kentucky	1	1	0
Louisiana	2	2	0
Maine	5	4	1
Maryland	4	4	0
Massachusetts	2	2	0
Michigan	5	5	0
Minnesota	26	26	0
Missouri	1	1	0
New Hampshire	1	0	1
New York	10	8	2
North Carolina	1	1	0
North Dakota	5	5	0
Ohio	3	3	0
Pennsylvania	5	5	0
South Dakota	2	2	0
Texas	6	6	0
Virginia	2	1	1
Washington	2	2	0
Hawaii	2	2	0
Totals	128	119	9

are modified when included with the results of the final examinations of the National Board of Medical Examiners (see table 6).

There were 128 graduates of 10 approved medical schools in Canada tested for medical licensure in 1952 by 28 boards. The figures are given for each licensing board by school in table 2 and the numbers examined by each board in table 4. Of the 128 candidates examined, 119 passed and nine, or 7%, failed.

Four graduates of two approved medical schools no longer in operation were tested in two states. The percentage of failures was 50. Graduates of five unapproved medical schools were examined in 6 states and graduates of seven schools of osteopathy by 10 boards. Represented were 60 graduates of unapproved schools, of whom 16 passed and 44, or 73.3%, failed, and 194 osteopathic graduates, of whom 157 passed and 37, or 19.6%, failed. Graduates of foreign faculties of medicine were examined by 38 boards. There were 1,208 such graduates, with 560, or 46.3% failures.

Totals for the six categories are given in table 5. It will be noted that 2.7% of the graduates of the existing approved medical schools in the United States failed, and 7% of the graduates of Canadian schools. The greatest number of failures fell within three groups: foreign faculties of medicine, unapproved medical schools, and schools of osteopathy. Those in these three groups registered by medical boards are separately discussed in later tables. Elsewhere (see tables 12, 13, and 14) are given figures referring to actual numbers of licentiates and additions to the medical profession.

TABLE 5.—*Source of Candidates Examined for Licensure in the United States, 1952*

Medical Schools	Number of Schools	Number Examined	Number Passed	Number Failed	Percentage Failed
Approved Schools in United States	72	5,434	5,287	147	2.7
Approved in Canada	10	128	119	9	7.0
Extinct	2	4	2	2	50.0
Foreign	163	1,208	648	560	46.3
Unapproved Schools	5	60	16	44	73.3
Schools of Osteopathy	7	194	157	37	19.6
		7,028	6,229	799	11.3

Consolidated Results of Examinations

The combined results of two groups of examinations, the state medical board examinations and part 3 of the examinations of the National Board of Medical Examiners, are given in table 6. This table perhaps represents the most comprehensive analysis of the performance of physicians in licensing examinations. It will be noted that many of the schools having a high percentage of failures before state licensing boards had few, if any, failures before the National Board. This is particularly true in instances where the number examined by state boards from a given school was considerably less than those taking the National Board examinations.

In 1952 there were 5,434 graduates of approved medical schools examined by state boards, of whom 147, or 2.7%, failed. In the same calendar year, 2,064 graduates of these schools were tested in the final examination of the National Board, of whom 88, or 4.2%, failed. In both groups, a total of 7,498 were examined, of whom 7,263 passed and 235, or 3.1%, failed.

Of the graduates of Canadian medical schools, 7% failed state board examinations in the United States, 4.4% failed the National Board test, and 6.5% failed both groups combined. Only 24 graduates of foreign medical schools were examined by the National Board, while 1,208 were examined by state boards. There is no

TABLE 6.—*Combined Results of Examinations of State Boards and the National Board of Medical Examiners, 1952*

School	Results by Medical Examining Board Tests		Part 3 Examination of National Board of Medical Examiners		Total Examined	Totals		Percentage Failed
	P	F	P	F		P	F	
Medical College of Alabama...	60	0	0	0	60	60	0	0.0
University of Arkansas.....	84	0	0	0	84	84	0	0.0
College of Medical Evangelists	78	3	41	2	124	119	5	4.0
Univ. of Southern California..	68	0	12	0	80	80	0	0.0
Stanford University	61	1	6	0	68	67	1	1.5
University of California.....	69	0	2	0	71	71	0	0.0
University of Colorado.....	69	1	3	0	73	72	1	1.4
Yale University	7	0	57	1	65	64	1	1.5
Georgetown University	10	2	101	6	119	111	8	6.7
George Washington University	13	0	72	3	88	85	3	3.4
Howard University	50	3	23	3	79	73	6	7.6
Emory University	90	2	8	0	100	98	2	2.0
Medical College of Georgia.....	90	0	0	0	90	90	0	0.0
Chicago Medical School.....	48	7	25	2	82	73	9	11.0
Northwestern University	154	6	26	3	189	180	9	4.8
Stritch School of Medicine.....	88	0	7	0	95	95	0	0.0
University of Chicago.....	54	0	23	0	77	77	0	0.0
University of Illinois.....	192	9	25	1	227	217	10	4.4
Indiana University	164	4	4	1	173	168	5	2.9
State University of Iowa.....	103	1	10	1	115	113	2	1.7
University of Kansas.....	84	5	0	0	89	84	5	5.6
University of Louisville.....	106	3	1	0	110	107	3	2.7
Louisiana State University....	103	1	0	0	104	103	1	1.0
Tulane University	162	1	12	1	176	174	2	1.1
Johns Hopkins University.....	89	1	15	1	106	104	2	1.9
University of Maryland.....	116	0	13	1	130	129	1	0.8
Boston University	5	2	58	0	65	63	2	3.1
Harvard Medical School.....	46	0	134	1	181	180	1	0.6
Tufts College Medical School..	13	1	94	11	119	107	12	10.1
University of Michigan.....	141	1	4	0	146	145	1	0.7
Wayne University	76	1	1	0	78	77	1	1.3
University of Minnesota.....	132	0	15	0	147	147	0	0.0
St. Louis University.....	140	2	8	0	150	148	2	1.3
Washington University	112	1	15	1	129	127	2	1.6
Creighton University	90	2	14	0	106	104	2	1.9
University of Nebraska.....	87	4	11	0	102	98	4	3.9
Albany Medical College.....	2	0	43	3	48	45	3	6.3
State Univ. of N. Y., Brooklyn	19	2	99	2	122	118	4	3.3
University of Buffalo.....	13	2	62	1	78	75	3	3.8
Columbia University	17	0	101	3	121	118	3	2.5
Cornell University	38	3	71	3	115	109	6	5.2
New York Medical College.....	4	3	115	6	128	119	9	7.0
New York University.....	30	4	127	8	169	157	12	7.1
University of Rochester.....	26	1	52	2	81	78	3	3.7
State Univ. of N. Y., Syracuse	20	0	49	2	71	69	2	2.8
Duke University	40	2	75	0	117	115	2	1.7
Bowman Gray School of Med.	67	0	0	0	67	67	0	0.0
University of Cincinnati.....	103	3	2	0	108	105	3	2.8
Western Reserve University....	87	1	11	0	99	98	1	1.0
Ohio State University.....	93	0	9	3	105	102	3	2.9
University of Oklahoma.....	57	0	0	0	57	57	0	0.0
University of Oregon.....	61	1	2	0	64	63	1	1.6
Hahnemann Medical College....	28	4	73	6	111	101	10	9.9
Jefferson Medical College.....	167	2	23	0	192	190	2	1.0
Temple University	69	1	88	4	162	157	5	3.1
University of Pennsylvania....	114	0	30	2	146	144	2	1.4
Woman's Medical College.....	21	0	22	1	44	43	1	2.3
University of Pittsburgh.....	89	1	3	0	93	92	1	1.1
Med. College of South Carolina	58	0	6	0	64	64	0	0.0
University of Tennessee.....	184	5	0	0	189	184	5	2.6
Meharry Medical College.....	67	3	8	0	78	75	3	3.8
Vanderbilt University	59	2	1	0	62	60	2	3.2
Southwestern Medical School..	71	2	1	0	74	72	2	2.7
University of Texas.....	92	5	0	0	97	92	5	5.2
Baylor University	88	5	2	0	95	90	5	5.3
University of Utah.....	40	0	5	1	46	45	1	2.2
University of Vermont.....	19	2	30	1	52	49	3	5.8
University of Virginia.....	79	10	4	0	93	83	10	10.8
Medical College of Virginia....	99	12	2	0	113	101	12	10.6
University of Washington.....	30	0	0	0	30	30	0	0.0
University of Wisconsin.....	82	2	2	0	86	84	2	2.3
Marquette University	100	5	18	1	124	118	6	4.8
Subtotals: U. S. Schools.....5,287	147	1,976	88	7,498	7,263	235	3.1
University of Alberta.....	8	1	0	0	9	8	1	11.1
University of Manitoba.....	23	0	0	0	23	23	0	0.0
Dalhousie University	13	1	3	0	17	16	1	5.9
Queen's University	4	0	3	0	7	7	0	0.0
University of Ottawa.....	3	0	0	0	3	3	0	0.0
University of Western Ontario	10	0	3	0	13	13	0	0.0
University of Toronto.....	28	1	7	1	37	35	2	5.4
McGill University	25	0	22	1	48	47	1	2.1
University of Montreal.....	2	3	0	0	5	2	3	60.0
Laval University	3	3	0	0	6	3	3	50.0
Subtotals: Canadian Schools 119	9	38	2	168	157	11	6.5
Extinct Medical Schools.....	2	2	0	0	4	2	2	50.0
Unapproved Medical Schools...	16	44	0	0	60	16	44	73.3
Schools of Osteopathy.....	157	37	0	0	194	157	37	19.6
Foreign Medical Faculties.....	648	560	22	2	1,232	670	562	45.6
Totals.....6,229	799	2,036	92	9,156	8,265	891	9.8

comparison to be made of these groups. The National Board did not examine in 1952 a graduate of an approved medical school not now in operation and does not admit to its examinations graduates of unapproved medical schools or schools of osteopathy—the two groups that had a high percentage of failures before state boards.

The total of all candidates examined by state boards was 7,028, of whom 6,229 passed and 799, or 11.3%, failed. For both groups—state boards and the National Board—9,156 were examined, 8,265 passed, and 891, or 9.8%, failed.

TABLE 7.—*Licensure Failures by Graduates of Existing Approved Medical Schools in the United States Located in the State Where Examined and Elsewhere, 1952*

States with Four Year Medical Schools	Total No. Examined	No. of Failures of Schools in State	No. Schools in State Represented at Examinations	Per Cent Failed	No. Failures of Schools Out of State	No. Schools Out of State Represented at Examinations	Per Cent Failed	Per Cent Failed in All U. S. Schools
Alabama.....	67	0	1	0.0	0	11	0.0	0.0
Arkansas.....	79	0	1	0.0	0	0	0.0	0.0
California.....	669	4	4	0.7	2	40	0.3	1.0
Colorado.....	85	0	1	0.0	0	18	0.0	0.0
Connecticut.....	38	0	0	0.0	3	9	7.9	7.9
Dist. of Columbia..	15	0	3	0.0	0	5	0.0	0.0
Georgia.....	149	0	2	0.0	0	8	0.0	0.0
Illinois.....	693	15	5	2.2	6	27	0.9	3.0
Indiana.....	175	1	1	0.6	0	11	0.0	0.6
Iowa.....	120	0	1	0.0	2	4	1.7	1.7
Kansas.....	97	4	1	4.1	0	10	0.0	4.1
Kentucky.....	124	0	1	0.0	0	6	0.0	0.0
Louisiana.....	218	0	2	0.0	0	18	0.0	0.0
Maryland.....	226	0	2	0.0	1	16	0.4	0.4
Massachusetts.....	86	0	2	0.0	1	10	1.2	1.2
Michigan.....	248	0	2	0.0	0	27	0.0	0.0
Minnesota.....	220	0	1	0.0	0	27	0.0	0.0
Missouri.....	238	0	2	0.0	0	16	0.0	0.0
Nebraska.....	97	4	2	4.1	0	0	0.0	4.1
New York.....	610	5	8	0.8	13	30	2.1	2.8
North Carolina.....	141	0	2	0.0	0	21	0.0	0.0
Ohio.....	401	3	3	0.7	0	24	0.0	0.7
Oklahoma.....	53	0	1	0.0	0	0	0.0	0.0
Oregon.....	30	1	1	3.3	0	1	0.0	3.3
Pennsylvania.....	338	1	6	0.3	1	21	0.3	0.6
South Carolina.....	64	0	1	0.0	0	7	0.0	0.0
Tennessee.....	204	0	3	0.0	0	2	0.0	0.0
Texas.....	337	11	3	3.3	3	27	0.9	4.2
Utah.....	26	0	1	0.0	0	7	0.0	0.0
Vermont.....	9	0	1	0.0	0	2	0.0	0.0
Virginia.....	178	21	2	11.8	0	2	0.0	11.8
Washington.....	58	0	1	0.0	0	16	0.0	0.0
Wisconsin.....	150	0	2	0.0	0	18	0.0	0.0
Subtotals.....	6,183	70	69	1.1	32	441	0.5	1.7
States Without Four Year Medical Schools								
Arizona.....	14				0	10	0.0	
Delaware.....	19				1	10	5.3	
Florida.....	473				43	60	9.1	
Idaho.....	10				0	8	0.0	
Maine.....	18				0	6	0.0	
Mississippi.....	83				0	16	0.0	
Montana.....	8				0	6	0.0	
Nevada.....	0				0	0	0.0	
New Hampshire.....	9				0	5	0.0	
New Jersey.....	54				0	19	0.0	
New Mexico.....	3				0	1	0.0	
North Dakota.....	26				0	8	0.0	
Rhode Island.....	33				0	8	0.0	
South Dakota.....	15				0	6	0.0	
West Virginia.....	19				1	8	5.3	
Wyoming.....	1				0	1	0.0	
Alaska, Hawaii, Puerto Rico and Guam.....	60				0	22	0.0	
Subtotals.....	845				45	190	5.6	

Failures in Medical Licensure Examinations

Data recorded in table 7 refer to previous failures before medical examining boards by physicians licensed in 1952. In the presentation of these statistics the United States is divided into two groups, the 32 states and the District of Columbia in which approved four year medi-

cal schools are located and the states, territories, and outlying possessions that had no four year medical school in complete operation in 1952. The figures include the total number examined, the number of licentiates who failed state board examinations prior to licensure and were graduates of a medical school located in the state in which they were examined, and the number of graduates licensed in a given state who obtained their professional training in schools in other states.

Of the 7,028 candidates for licensure in 1952, 70 failed examinations in the state in which they were trained. This occurred in 11 states. There were 32 failures reported by 9 states among graduates from approved schools located in states other than the one in which they were examined. Eighteen states had no failures in either group, and four had failures in both.

In the 16 states, territories, and outlying possessions that do not have medical schools, three boards reported

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates, 1952*

	Licenses Issued by Examination, Reciprocity or Endorsement	Approved Medical Schools in the United States and Canada					Foreign Faculties of Medicine					Unapproved Medical Schools in the United States					Schools of Osteopathy in the United States					Total Failures by Licentiates, 1952
		Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			Licensed After One Failure		Licensed After Two or More Failures			
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere	
Alabama	164	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Arizona	86	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Arkansas	135	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
California	1,581	9	11	1	2	1	17	5	8	3	..	..	..	..	..	..	..	..	..	..	..	57
Colorado	117	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Connecticut	213	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	2	..	..	5
Delaware	38	..	2	..	..	..	..	..	..	2	..	..	..	..	1	..	..	..	..	..	..	5
District of Columbia	147	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	3
Florida	583	18	2	4	1	..	1	..	..	3	1	..	..	..	1	..	..	..	..	..	..	31
Georgia	229	..	5	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	6
Idaho	70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Illinois	649	12	3	..	1	2	49	1	13	..	3	..	..	..	..	..	..	..	..	..	..	84
Indiana	315	1	2	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	5
Iowa	184	1	1	..	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	..	..	5
Kansas	180	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Kentucky	214	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Louisiana	391	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Maine	48	1	..	..	..	..	..	1	..	2	1	..	..	..	1	..	..	..	..	..	..	6
Maryland	394	..	2	..	..	..	5	2	1	..	..	..	..	..	..	..	..	..	..	..	..	10
Massachusetts	321	1	..	..	..	..	..	..	4	..	2	..	..	5	..	..	..	..	..	..	..	12
Michigan	399	..	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Minnesota	351	..	3	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
Mississippi	134	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Missouri	391	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Montana	43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Nebraska	126	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
Nevada	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
New Hampshire	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
New Jersey	361	..	3	1	..	..	..	6	1	8	..	..	..	..	..	..	..	6	1	2	..	28
New Mexico	61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
New York	1,292	11	2	9	..	1	41	4	61	1	1	..	..	1	..	1	8	..	5	..	1	147
North Carolina	292	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
North Dakota	39	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Ohio	686	2	1	..	2	..	1	6	7	11	2	..	..	..	..	..	1	..	1	1	..	35
Oklahoma	131	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Oregon	117	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Pennsylvania	628	1	2	..	3	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	7
Rhode Island	62	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	..	..	..	5
South Carolina	122	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
South Dakota	33	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Tennessee	303	..	1	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3
Texas	609	4	4	..	3	..	1	..	1	..	..	..	..	..	1	..	..	..	1	..	..	15
Utah	75	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Vermont	32	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Virginia	239	5	1	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	9
Washington	187	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1
West Virginia	94	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Wisconsin	247	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	3
Wyoming	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0
Alaska, Hawaii and Puerto Rico	125	..	1	1	..	1	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	6
Totals	13,228	74	66	16	17	6	121	36	97	34	12	0	0	6	4	1	10	8	10	5	1	524

Almost all states require the applicant to receive a general average of 75% in the medical license examination and at least 50% in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail and do not report them as failures. Such examinees are not included in any of the tabulations. When their grades are raised to the passing mark, they are recorded among those who passed.

45 failures. The total number examined in the first group, states in which approved medical schools are located, was 6,183, while in the second group, states that have no approved four year medical school, 845 persons were examined.

In table 8 the figures pertaining to those who failed examinations prior to licensure in 1952 are presented in four categories as follows: approved schools in the United States and Canada, foreign faculties of medicine, unapproved medical schools, and schools of osteopathy. These groups are classified according to the number

licensed after failing a state board examination once and the number licensed after two or more failures. The table further indicates whether the single and multiple failures occurred in the state where the physician was licensed or elsewhere. The total number of candidates licensed after examination or by endorsement of credentials is shown and also the total number of failures in all groups.

There were 13,228 licenses to practice medicine issued during the calendar year 1952. This figure includes 524 physicians who had previously been unsuccessful before a licensing board. In 11 states all physicians licensed in 1952 had no previous failure in a state board examination. Of the graduates of approved schools, 179 had previously failed a state board examination; 74 had failed once in the state in which they were licensed, while 66 were licensed after one failure in another state. Thirty-nine were licensed after more than one failure.

In the group of graduates of foreign faculties of medicine, 300 were licensed after previous failure; 157 had one failure and 143 multiple failures before licensure.

TABLE 9.—RECIPROCITY AND ENDORSEMENT

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by: Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (reg. & homeo. bds.)	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	+	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies											..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	+	..	..	..	+	+	+	..	..	+	..	+	..	+	+	..	+	+	..	+	..	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17	Louisiana (reg. & homeo. bds.)	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	17
18	Maine	..	..	+	+	..	..	..	..	..	+	..	..	..	..	..	..	+	..	+	+	+	..	+	+	+	+	+	+	..	+	..	18
19	Maryland (reg. & homeo. bds.)	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	19
20	Massachusetts	+	..	..	..	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	..	..	..	+	+	+	+	+	..	+	+	..	20
21	Michigan	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+[41]	+	+	+[41]	+[41]	+	..	..	+	+[41]	..	+[41]	+	+[41]	+	+	+	..	+[41]	+	..	+	+	+	+	+	+	+[41]	+	+	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	23
24	Missouri	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	29
30	New Mexico	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	32
33	North Dakota	+	..	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	..	..	+	..	..	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	..	+	+	+	+	+	..	+	..	..	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	+	+	+	38
39	South Carolina	+	..	..	..	..	..	..	+	..	..	..	+	..	..	+	+	+	+	+	..	+	..	+	+	..	+	..	+	+	..	+	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	..	+	+	+	+	+	..	..	..	+	+	+	..	+	+	+	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	41
42	Texas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	42
43	Utah	+	+	+	+	+	+	+	..	..	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	..	..	..	..	..	..	..	..	13	..	13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	38	38	+	+	+	..	+	..	+	38	38	38	38	+	+	+	38	+	+	+	+	+	+	+	..	+	..	47
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	+	..	..	+	+	+	..	50
51	Guam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Hawaii	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52
53	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	..	..	..	..	53
54	Virgin Islands	No reciprocal relations							..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.
2. In most cases there is a small additional recording or registration fee.
3. Year of practice after internship required.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. All applicants must be graduates of a medical school approved by the American Medical Association.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Canadian citizens are required to file first papers.
11. Not applicable to citizens of Canada.
12. Oral examination required when application is based on a license issued by some other state dated ten or more years prior to filing application.
13. No reciprocity.
14. Oral examination required.
15. Certificate used as the basis for application must be dated one or more years prior to filing application.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. In lieu of its own examination, certificate of National Board may be accepted in whole or in part.
19. Regular and Homeopathic boards.
20. Reciprocity is extended to all states which accept Oregon licentiates on reciprocity basis.
21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some

Eleven graduates of unapproved medical schools were licensed after two or more failures. One of these graduates had failed 23 times, two others 36 and 19 times in the state in which they were licensed. Licenses were granted to 34 graduates of schools of osteopathy after previous failure. Here again, it was noted that one licentiate had 18 previous failures. A few of the states have no restrictions on the number of examinations that may be taken prior to licensure, but most states have a set limit of three examinations.

Registration by Reciprocity and Endorsement

A summary of the reciprocity and endorsement policies pertaining to medical licensure is included in table 9. One state, Florida, requires all applicants for licensure to pass a written examination. Thirty licensing boards have reciprocal agreements with specific states. Thirty-nine boards are given discretionary powers under the medical practice acts to endorse applicants. These boards will register physicians who present credentials that correspond with those required by their respective states

POLICIES OF MEDICAL LICENSING BOARDS

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		⊕	1[4]	⊕[11]	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[8]	⊕	3[4,7]	1st P	100	42	2
3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	..	..	..	⊕	⊕	1[4]	⊕	50[22]	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		⊕	0	⊕[21]	100	12,13	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[43]	+[9]		⊕	1[4]	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+	⊕[10]	⊕	3[16]	1st P[10]	50	..	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[5]		⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[37]		..	1[3]	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	9
10	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+		..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		..	..	⊕	100	..	11
12	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	..	+[17]		..	1	1st P	25	17,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..		..	1[4]	..	50	..	13
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	..	1[4]	⊕[11]	50	..	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		..	1[4,7]	⊕	50[22]	42	15
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		+	1[4]	⊕	75	..	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+[25]		..	1[4]	1st P[10,30]	50[22]	42	17
18	..	..	+	..	+	..	+	..	+	..	+	..	+	+	+	..	+	+	+	..	..	..	+		..	1[4]	..	50	..	18
19	+	+	..	+	+	+	+	+	+	..	+	+	..	+	+	..	+	+	..	+	..	+	+		..	1[4]	1st P	50	42	19
20	+[44]	+	..	+	+	..	+	+	+	..	+	+	+	+	+	..	+	+	..	+	..	+	+		..	0	1st P	50[28]	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[35]	⊕[37]	⊕	1[4]	+	100	24	21
22	+[41]	+	..	+[43]	+	+	+	+[41]	..	+	+	+	..	+	+	+	+	+	+	+	..	+	+		..	0	1st P	75	11,17,42	22
23	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+		..	..	⊕[11]	50	..	23
24	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+[27]		⊕[33]	1[4]	⊕	100[22]	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		..	1[4]	⊕	75	14,42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	⊕	..	1[4]	⊕	50	..	26
27	+	+	..	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	..	..	..	..	+	⊕	⊕	1[4]	⊕	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		..	0	⊕[11]	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+		⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	1[4]	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		..	2	1st P	30	..	31
32	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+		..	0	..	100	42,6	32
33	..	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+		⊕	1	⊕[11]	50[22]	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+		..	1[4]	1st P	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕[32]	⊕	1[4]	⊕	100	42,11,6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+[20,23,24]	+[9,27]		⊕	1[4]	⊕	100	..	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		⊕	2[24]	1st P	50	42	37
38	..	+	..	+	+	..	+	..	..	..	+	..	..	+	..	+	+	+	..	..	..	+[14]	+[14]	⊕	⊕	0	1st P	20	14	38
39	..	+	..	+	+	+	..	..	..	+	..	..	+	..	+	..	+	+	..	..	+	..	+[14]		⊕	1[4]	⊕	50	42	39
40	..	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	1	1st P	50	..	40
41	+	+	+	+	+	+	+	+	..	+	..	+	+	..	+	+	+	+	..	..	..	+	+[30]		⊕	0	⊕	50	42	41
42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	⊕	⊕	0	⊕	50	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	+	+		⊕	3[1]	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[44]		⊕	1[3]	⊕	50	11	44
45	..	..	..	..	..	..	..	13	..	..	..	..	..	..	..	..	..	..	..	13	..	+[39]	+	⊕	⊕	2[26]	⊕[41]	50	..	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+[8]	⊕[8]	⊕	0	..	35	..	46
47	..	+	+	+	+	+	+	[38]	+	+	+	+	+	+	..	..	+	+	+	+	..	..	..		⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	..	+	..	+[14]	+[18]	⊕	⊕	1[29]	1st P	75[36]	6	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+[14]	+[14]		⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		⊕	0	⊕	50	6	51
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+		..	..	⊕	25	42,6	52
53	..	..	+	..	..	..	..	..	+	..	..	..	..	..	..	..	..	+	..	..	..	+[8,39]	+		..	1[3]	⊕	30	..	53
54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	54

secretary of the licensing board of the state in which the physician is interested.

state or on proof of requirements similar to those required by California for graduates of foreign medical schools.

22. Fee same as applicant's state charges.

23. Oral examination required if applicant's state requires it.

24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.

25. License in state with which Louisiana reciprocates required.

26. Internship accepted at the discretion of the board as the equivalent of two years' practice.

27. Fee, $25.

28. Fee for license on basis of National Board certificate, $25.

29. A two year internship or a year of residency is accepted.

30. Diplomates of National Board not required to have been in practice for three years.

31. Same as required of candidates of state applying for licensure.

32. Not required for licensure by reciprocity.

33. Reciprocity applicants only.

34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.

35. May be licensed after a special (written) supplemental examination.

36. Fee same as applicant's state charges but not less than $75.

37. For matriculants after Oct. 15, 1937.

38. Licentiates of California, Colorado, Indiana, Iowa, Kansas, Massachusetts, and Rhode Island accepted on reciprocal basis at discretion of board.

39. Reciprocity extended at discretion of board to licentiates candidates whose qualifications would entitle them to admission to examination and who took examination equivalent to that required by this board.

40. Permanent license withheld until completion of citizenship.

41. At the discretion of the board.

42. Graduates of foreign medical schools are not accepted for licensure by reciprocity.

43. Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.

44. Fee $20

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement of Credentials, 1952*

| States Issuing Licenses by Reciprocity or Endorsement | Marginal Number | Total Licensed | Source of Former License or Credentials | | |

in the year issued. Eighteen boards that have reciprocal agreements also have similar discretionary powers to endorse applicants from nonreciprocating states.

Twenty-one boards require applicants for licensure without written examination to present the certificate of the board of examiners in the basic sciences. In the section of this report pertaining to basic science boards there is included a summary of the reciprocity, endorsement, exemption, or waiver policies of these boards.

The states in which physicians certified by the National Board of Medical Examiners are accepted for licensure on the basis of the board's certificate are also indicated. All boards but those of Arkansas, Florida, Nebraska, and Texas accept diplomates, although a number of them have additional requirements. Details pertaining to these requirements are briefly referred to in footnotes and more explicitly in the section on the National Board of Medical Examiners.

Additional requirements, including professional practice, citizenship, oral examinations, and internship, are recorded, as is also the fee for a license without written examination. Several of the boards exempt citizens of Canadian birth from the citizenship requirement. This is indicated by a footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnotes.

This chart will be available in reprint form. It is helpful to physicians who are considering a change in location. The data recorded are intended to be merely a summary of licensure policies. The information here given should be supplemented by direct communication with the licensing boards. A list of the executive officers in charge of medical licensure appears elsewhere in this report.

The procedure in issuing licenses by reciprocity or endorsement varies. Some states consider applications for licensure at any time, while others hold monthly, quarterly, or semiannual meetings. The policy in effect in each state is contained in table 25. In addition, THE JOURNAL publishes biweekly the exact dates when applications are considered.

In table 10 are presented data pertaining to the credentials accepted as the basis for licenses granted without written examination in 1952. There were 7,016 so registered on the basis of licenses issued by other boards, the certificate of the National Board of Medical Examiners, by special exemption, and by acceptance of service with an agency of the government of the United States.

California issued the greatest number of licenses by this method. In this state 1,130 were registered. New York licensed 991. Five other states licensed more than 275, namely Massachusetts 290, New Jersey 313, Ohio 293, Pennsylvania 294, and Texas 291. The largest number of candidates presenting the same type of credentials were the 2,678 diplomates certified by the National Board of Medical Examiners.

There were 378 licenses that were issued in Illinois, 278 in Ohio and Pennsylvania, and 276 in New York presented to other states for reciprocal registration. No physician holding a New Mexico license applied for registration in another state during the year and only one from Nevada did so.

Ninety-four medical officers of one of the federal services received licenses by endorsement of military credentials in seven states.

Twenty were licensed by six boards on the basis of a license issued in Alaska, Hawaii, or Puerto Rico; 44 by eight boards on the basis of Canadian or foreign credentials; and 12 by five boards by special exemption.

In table 11 are recorded the numbers from individual schools represented by the 7,016 reciprocity licentiates. Every approved medical school in the United States and Canada had graduates licensed without written examination in 1952. The 7,016 licentiates included 6,617 graduates of schools in the United States and 107 from Canadian medical schools. More than 200 graduates of three schools secured such licenses. Licenses were obtained by 115 foreign-trained physicians in 23 states, and 75 graduates of approved medical schools no longer in operation were registered in 29 states. Twenty-seven graduates of unapproved medical schools secured licenses in 8 states, and 75 graduates of schools of osteopathy were registered in 14 states. This table reflects the movement of physicians to states other than the one in which they obtained their professional training or in which they first established their practice.

Licentiates Representing Additions to the Medical Profession

Licentiates of 1952 who received their first license to practice medicine and surgery during the last calendar year and thus represent additions to the medical profession are shown in table 12. The compilation of this table includes candidates examined and licensed in 1952, some who were examined in previous years but whose licenses were withheld until 1952 pending completion of a required internship, citizenship, or other technicalities, and physicians not previously licensed in any state who were certified during the year on the basis of the examinations of the National Board of Medical Examiners. The figures also include physicians licensed on the basis of government credentials, Canadian licenses, and foreign credentials. The majority represent recent graduates.

There were 6,885 additions to the medical profession in the United States and its territories and outlying possessions. In 1952, 3,829 deaths of physicians were reported to the offices of the American Medical Association. Deducting the number of deaths in 1952 from the number licensed for the first time, the net increase in the physician population was 3,056.

The increase in 1952 included 560 more than were added in 1951.[2] As compared with the previous year, increases of first licentiates occurred in 34 states.

The 6,885 licentiates representing additions to the medical profession in the last calendar year represented 5,168 who secured their licenses by examination and 1,717 by endorsement of credentials. The majority of the latter were diplomates of the National Board of Medical Examiners.

The number of first licentiates arranged in nine geographic divisions are compiled in table 13.

2. J. A. M. A. 149: 446 (May 31) 1952.

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine
	ALABAMA																		
1	Medical College of Alabama, Birmingham	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..
	ARKANSAS																		
2	University of Arkansas School of Medicine, Little Rock	2	1	1	7	..	..	..	..	..	3	1	..	..	..	3	..	5	..
	CALIFORNIA																		
3	College of Medical Evangelists, Loma Linda-Los Angeles	8	1	3	14	4	..	..	2	..	5	7	..	3	1	1	2	..	..
4	University of Southern California School of Medicine, Los Angeles	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	1	..	..
5	Stanford University School of Medicine, Stanford University-San Francisco	..	2	..	8	..	..	..	1	..	..	1	..	..	..	..	1	..	..
6	University of California School of Medicine, San Francisco	..	1	..	2	2	..	..	..	..	..	..	1	..	..	1	..	..	..
	COLORADO																		
7	University of Colorado School of Medicine, Denver	1	5	1	15	2	2	..	..	..	..	1	..	..	2	1	..	1	..
	CONNECTICUT																		
8	Yale University School of Medicine, New Haven	1	1	..	11	1	20	..	..	..	2	1	..	1	2	2	..	..	..
	DISTRICT OF COLUMBIA																		
9	Georgetown University School of Medicine, Washington	3	1	..	12	1	4	..	26	..	2	..	..	1	..	..	..	..	..
10	George Washington University School of Medicine, Washington	1	1	..	19	1	2	2	38	..	..	1	2	..	3	..	3	..	3
11	Howard University College of Medicine, Washington	2	..	..	5	..	1	..	6	..	2	..	..	1	..	..	1	..	..
	GEORGIA																		
12	Emory University School of Medicine, Atlanta (Emory University)	7	..	1	1	..	1	..	..	..	..	..	1	..	..	2	2	2	..
13	Medical College of Georgia, Augusta	5	..	..	4	..	..	..	1	..	..	..	..	..	1	..	1	7	..
	ILLINOIS																		
14	Chicago Medical School	1	..	..	7	..	..	..	1	..	..	..	..	1	..	..	..	..	..
15	Northwestern University Medical School, Chicago	..	2	4	31	7	1	..	..	..	2	2	7	6	5	5	2	..	1
16	Stritch School of Medicine of Loyola University, Chicago	..	1	..	14	1	..	..	1	..	..	..	2	10	3	2	..	2	..
17	University of Chicago, The School of Medicine	1	3	..	19	1	2	1	1	..	..	1	4	3	2	1	..	1	..
18	University of Illinois College of Medicine, Chicago	3	..	3	68	3	1	..	..	..	3	..	11	17	6	3	2	..	..
	INDIANA																		
19	Indiana University School of Medicine, Bloomington-Indianapolis	..	1	..	47	..	4	..	1	..	2	1	5	..	1	..	2	1	..
	IOWA																		
20	State University of Iowa College of Medicine, Iowa City	..	3	..	14	..	1	..	..	..	1	1	5	..	7	4	1	..	..
	KANSAS																		
21	University of Kansas School of Medicine, Lawrence-Kansas City	..	2	..	22	2	..	..	..	..	..	2	2	..	..	1	1	1	..
	KENTUCKY																		
22	University of Louisville School of Medicine	2	..	..	22	1	1	..	..	..	6	..	4	11	3	2	6	2	..
	LOUISIANA																		
23	Louisiana State University School of Medicine, New Orleans	5	..	..	12	..	1	..	..	..	..	..	..	1	..	..	..	..	..
24	Tulane University of Louisiana School of Medicine, New Orleans	9	3	4	17	2	2	..	1	..	2	..	2	4	1	1	1	6	..
	MARYLAND																		
25	Johns Hopkins University School of Medicine, Baltimore	1	..	1	12	1	2	..	3	..	3	1	1	5	..	..	..	..	1
26	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	..	..	..	12	2	..	2	7	..	5	1	3	1	1	1	2	1	..
	MASSACHUSETTS																		
27	Boston University School of Medicine	..	..	..	12	1	7	..	..	..	..	..	1	..	..	..	..	1	3
28	Harvard Medical School, Boston	..	3	2	29	2	10	..	4	..	1	1	9	2	3	..	2	3	2
29	Tufts College Medical School, Boston	2	..	..	15	..	15	1	..	..	1	..	..	1	1	..	3	2	4
	MICHIGAN																		
30	University of Michigan Medical School, Ann Arbor	..	2	1	26	..	3	..	2	..	..	..	9	4	..	1	1	1	..
31	Wayne University College of Medicine, Detroit	..	1	..	15	3	..	..	..	..	2	1	..	3	2	2	1	..	..
	MINNESOTA																		
32	University of Minnesota Medical School, Minneapolis	1	..	..	47	5	..	..	..	..	..	2	..	1	3	1	1	..	..
	MISSOURI																		
33	St. Louis University School of Medicine	..	3	2	27	..	1	..	4	..	1	..	8	5	4	5	3	4	..
34	Washington University School of Medicine, St. Louis	1	2	2	22	1	..	..	..	..	..	1	8	5	2	5	3	6	..
	NEBRASKA																		
35	Creighton University School of Medicine, Omaha	..	2	..	19	2	1	..	..	..	..	3	1	..	7	4	..	..	..
36	University of Nebraska College of Medicine, Omaha	..	1	1	19	5	..	..	..	..	..	5	4	1	6	4	..	..	1
	NEW YORK																		
37	Albany Medical College	..	1	..	6	2	..	..	..	..	..	1	1	..	..	..	..	..	1
38	State University of New York College of Medicine at New York City, Brooklyn	1	..	..	22	2	5	..	..	..	..	..	2	1	..	..	1	1	..
39	University of Buffalo School of Medicine	..	..	1	20	1	10	1	2	..	..	..	1	..	..	..	1	1	1
40	Columbia University College of Physicians and Surgeons, New York	1	1	..	18	2	14	1	2	..	..	..	1	2	1	1	2	4	2
41	Cornell University Medical College, New York	3	1	..	7	..	6	..	..	..	1	1	3	3	..	1	1	..	..
42	New York Medical College, Flower and Fifth Avenue Hospitals	..	..	..	26	1	15	..	2	..	..	..	3	..	1	1	..	2	1
43	New York University College of Medicine	..	1	..	27	..	11	..	3	..	..	..	4	1	..	2	1	..	..
44	University of Rochester School of Medicine and Dentistry	..	1	..	14	1	6	..	..	..	2	..	..	1	2	2	..	..	..
45	State University of New York at Syracuse College of Medicine	2	..	..	6	1	2	..	1	..	..	..	..	2	..	..	..	1	1
	NORTH CAROLINA																		
46	Duke University School of Medicine, Durham	1	2	..	9	1	1	..	1	..	5	..	1	1	1	1	1	1	1
47	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	..	..	..	2	..	2	..	..	..	1	..	2	..	..	1	..	1	..
	OHIO																		
48	University of Cincinnati College of Medicine	..	..	..	23	3	1	..	1	..	1	..	2	2	3	1	7	..	2
49	Western Reserve University School of Medicine, Cleveland	..	1	1	23	1	2	..	..	..	..	..	2	2	1	1	2	..	..
50	Ohio State University College of Medicine, Columbus	2	1	..	28	..	2	..	1	..	..	..	2	1	1	1	4	5	..
	OKLAHOMA																		
51	University of Oklahoma School of Medicine, Oklahoma City	..	..	2	10	2	..	..	..	..	..	..	2	1	..	7	..	..	..
	OREGON																		
52	University of Oregon Medical School, Portland	1	1	1	17	2	2	..	..	..	..	5	..	..	1	1	..	..	..
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and the Canal Zone	Totals	Marginal Number
..	1	2	2	1	3	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	16	1
1	..	2	1	..	5	..	2	..	..	..	1	1	..	..	2	2	1	2	..	1	..	3	22	..	..	..	..	3	..	..	..	72	2
8	2	5	..	2	5	..	2	1	..	..	..	1	4	..	3	1	8	1	1	1	..	3	5	..	..	1	10	2	..	2	4	123	3
..	..	..	3	1	..	..	..	1	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	1	..	1	2	..	..	..	1	15	4
..	1	2	2	..	..	..	..	1	..	..	..	4	..	..	2	..	..	1	..	..	..	..	..	1	..	..	1	..	..	..	..	28	5
..	..	..	1	..	..	..	..	..	..	..	..	5	..	..	2	..	..	..	..	..	..	..	1	3	..	..	..	1	..	..	..	20	6
..	1	3	2	..	..	3	3	..	..	1	2	4	..	..	1	1	1	2	..	..	3	..	2	3	..	1	4	..	1	1	1	71	7
1	8	1	2	1	4	..	..	..	7	4	1	25	4	..	2	1	..	3	1	..	..	1	..	2	1	1	2	..	2	..	..	116	8
17	8	1	1	..	..	..	..	..	..	20	2	32	..	..	5	..	1	14	..	..	..	..	1	..	..	8	1	2	1	..	2	166	9
19	3	4	..	..	2	..	..	..	1	1	..	4	5	..	6	1	..	9	..	..	1	2	3	3	..	11	1	..	1	..	3	156	10
1	..	2	..	1	..	..	..	..	..	3	..	23	3	..	4	1	..	3	..	..	..	..	2	..	..	5	..	..	..	..	1	67	11
1	..	1	1	..	..	..	..	..	..	1	..	3	5	..	1	..	..	1	..	7	..	1	2	..	..	..	..	..	..	..	..	41	12
2	1	..	1	2	..	..	..	..	..	..	1	..	..	..	2	1	..	1	..	12	..	1	1	..	..	1	..	..	..	..	..	45	13
1	..	1	..	..	..	..	..	..	..	1	..	18	..	..	..	..	..	.	..	..	..	..	..	..	..	..	..	..	1	..	..	32	14
2	2	10	3	1	5	4	2	..	..	..	2	6	4	2	4	3	2	4	..	1	..	..	5	2	..	4	7	1	8	1	2	162	15
1	..	4	2	2	2	1	..	..	..	1	1	2	..	1	2	2	..	2	..	..	..	1	2	..	..	..	1	..	5	..	..	68	16
3	..	6	..	..	1	..	..	..	..	2	..	6	2	..	1	..	..	2	..	..	..	..	3	..	..	1	4	2	1	..	..	74	17
1	..	3	2	2	7	..	2	..	..	..	..	6	1	..	5	1	4	5	..	3	..	1	8	1	1	..	2	1	9	..	..	185	18
..	..	4	4	..	2	1	..	..	..	1	1	1	3	2	12	1	2	1	..	..	2	1	5	..	..	1	1	1	1	..	..	112	19
..	..	3	2	..	5	1	2	..	..	2	2	4	..	..	3	2	4	1	..	..	..	..	6	..	..	1	..	1	5	..	..	81	20
1	..	1	1	..	16	1	3	1	..	..	..	1	1	1	1	2	..	1	..	..	..	..	9	1	..	..	2	1	..	..	..	77	21
1	4	3	3	..	5	..	..	..	1	2	4	4	2	1	6	..	1	3	..	2	..	6	6	2	..	5	1	4	2	..	1	129	22
1	1	2	..	5	..	..	..	..	..	..	2	..	1	1	..	..	..	1	..	3	..	1	6	..	..	1	..	..	1	..	..	45	23
..	1	3	1	4	2	..	..	..	..	2	1	8	3	..	4	5	1	3	..	1	..	9	20	..	..	1	2	1	1	..	2	130	24
2	11	4	1	1	4	..	..	..	1	3	1	21	5	..	4	1	..	6	1	..	..	4	4	2	..	1	..	1	2	..	..	111	25
4	4	4	1	..	1	..	..	..	..	6	..	4	5	..	6	1	..	8	..	..	1	2	4	..	..	1	2	4	1	..	2	99	26
2	32	2	1	..	1	..	..	..	4	1	..	12	1	2	3	..	1	3	3	..	..	..	..	..	..	..	..	..	..	..	2	95	27
10	56	4	6	1	4	..	..	..	3	5	..	25	11	..	9	3	3	9	2	..	..	3	2	2	1	2	2	..	3	..	3	242	28
2	57	1	4	..	..	..	..	..	3	5	1	10	..	..	6	..	1	1	11	..	1	1	4	1	1	2	1	..	2	..	1	161	29
3	1	1	3	..	2	..	1	1	..	..	1	10	1	..	13	..	..	5	..	..	..	2	3	2	..	1	3	2	..	1	2	108	30
1	..	1	..	..	1	..	..	..	..	..	1	..	1	..	2	..	..	2	..	..	3	..	1	..	..	..	..	2	..	..	1	46	31
..	..	4	3	1	1	6	1	3	..	..	..	4	2	2	2	1	10	..	..	..	..	1	6	..	..	2	7	1	9	..	..	127	32
2	1	4	2	..	2	4	..	..	..	2	1	4	..	..	15	..	1	1	..	..	..	..	6	1	..	1	5	..	2	..	..	121	33
2	2	6	2	1	1	..	1	..	..	2	3	2	1	..	1	1	2	1	..	1	..	3	10	..	..	2	6	2	2	..	1	113	34
..	1	2	6	..	4	2	4	1	..	..	1	1	..	..	..	1	2	1	..	..	..	..	2	..	..	..	3	..	1	1	1	73	35
..	..	6	15	..	5	1	2	2	..	1	1	5	..	..	3	4	4	1	..	..	7	1	5	4	..	1	8	1	2	1	..	127	36
..	5	1	..	..	..	..	..	..	1	4	1	27	1	..	2	..	..	1	1	..	1	..	..	..	..	..	1	1	..	..	1	60	37
3	4	1	3	..	2	..	1	..	..	28	..	83	..	..	4	..	..	6	1	..	..	..	2	1	3	..	..	..	1	..	..	178	38
..	1	2	..	..	..	..	..	..	..	2	..	48	1	..	2	..	..	4	..	..	..	..	1	1	1	1	1	..	1	..	2	107	39
2	12	1	3	..	1	..	..	..	1	18	1	70	1	..	8	2	..	11	1	1	..	1	2	..	2	4	4	2	2	..	..	202	40
3	4	2	1	..	2	1	..	..	2	15	1	51	3	..	7	..	3	3	..	..	..	..	1	1	1	..	2	1	..	..	3	134	41
3	3	1	2	..	1	..	..	..	..	35	..	70	..	..	4	..	2	6	..	1	..	..	2	..	..	..	2	1	2	..	2	189	42
3	1	2	2	..	2	..	..	..	4	28	1	97	..	..	9	..	..	9	..	1	..	2	..	1	1	3	1	1	..	..	2	220	43
2	6	2	..	..	2	..	..	..	2	3	..	36	3	..	4	1	1	4	4	..	..	1	1	..	..	..	3	..	..	..	2	106	44
1	3	2	1	..	..	..	..	..	..	..	..	37	..	..	6	..	..	2	..	..	..	..	..	..	..	..	1	..	..	1	..	2	72	45
6	4	3	1	1	3	..	..	..	..	1	..	10	24	..	7	..	..	3	1	1	..	7	1	..	..	6	1	2	..	..	..	109	46
..	..	2	..	..	..	..	..	..	..	1	..	2	1	..	1	..	..	1	..	1	..	..	4	..	..	1	..	1	..	..	1	25	47
..	2	4	..	..	1	..	..	..	..	3	2	3	1	1	2	2	1	3	..	..	..	1	4	1	..	..	2	2	1	..	1	83	48
1	5	6	4	..	2	..	1	..	..	1	..	4	3	..	..	1	4	7	..	1	..	1	3	..	..	1	1	1	..	..	..	83	49
4	..	7	1	..	3	1	1	..	1	..	..	..	1	..	..	..	2	2	1	..	..	..	9	..	..	3	3	..	2	..	..	89	50
..	..	1	4	..	3	..	1	1	..	..	1	2	1	..	2	..	2	3	..	..	..	2	13	..	..	..	2	..	..	..	..	62	51
..	..	2	2	..	..	..	..	1	..	..	..	2	..	..	1	..	7	1	..	..	..	..	1	1	..	..	6	..	2	..	1	58	52
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

TABLE 11.—CANDIDATES LICENSED BY

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine
	PENNSYLVANIA																		
53	Hahnemann Medical College and Hospital of Philadelphia	..	1	2	24	..	3	..	2	..	..	1	3	1	1	1	..	1	..
54	Jefferson Medical College of Philadelphia	..	..	1	12	2	2	2	1	..	4	..	1	4	..	1	..	2	..
55	Temple University School of Medicine, Philadelphia	1	1	..	11	..	3	1	..	..	..	1	3	1	..	1	2	1	1
56	University of Pennsylvania School of Medicine, Philadelphia	..	3	1	14	2	3	1	3	..	1	1	2	..	1	..	3	1	1
57	Woman's Medical College of Pennsylvania, Philadelphia	1	..	..	5	..	..	1	2	..	1	..	2	..	..	..	..	..	1
58	University of Pittsburgh School of Medicine	..	1	..	6	..	1	..	1	..	1	1	2	2	..	..	..	..	..
	SOUTH CAROLINA																		
59	Medical College of South Carolina, Charleston	1	..	..	2	..	..	..	..	..	2	..	..	3	..	1	..	..	..
	TENNESSEE																		
60	University of Tennessee College of Medicine, Memphis	12	3	15	5	..	..	..	1	..	5	3	1	..	..	3	8	6	..
61	Meharry Medical College, Nashville	5	..	1	16	..	..	..	2	..	1	..	2	1	..	1	1	..	..
62	Vanderbilt University School of Medicine, Nashville	3	..	..	5	..	1	..	2	..	3	..	2	1	..	2	6	3	..
	TEXAS																		
63	Southwestern Medical School of the University of Texas, Dallas	..	..	..	5	..	..	..	..	..	..	..	1	..	1	..	..	..	..
64	University of Texas School of Medicine, Galveston	..	1	1	14	1	..	..	..	..	..	2	..	..	..	1	..	1	..
65	Baylor University College of Medicine, Houston	..	1	..	11	1	..	..	..	..	..	..	..	..	..	1	..	3	..
	UTAH																		
66	University of Utah College of Medicine, Salt Lake City	..	..	..	5	1	..	..	..	..	..	8	1	1	..	..	..	..	..
	VERMONT																		
67	University of Vermont College of Medicine, Burlington	1	..	..	8	..	8	1	..	..	..	..	..	..	..	..	..	..	1
	VIRGINIA																		
68	University of Virginia Department of Medicine, Charlottesville	1	1	..	6	1	1	..	1	..	5	..	..	2	..	..	1	1	..
69	Medical College of Virginia, Richmond	2	..	1	2	1	..	..	2	..	1	1	1	2	..	..	2	1	1
	WASHINGTON																		
70	University of Washington School of Medicine, Seattle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WISCONSIN																		
71	University of Wisconsin Medical School, Madison	..	..	..	17	2	..	2	1	..	..	..	..	3	3	..	..	..	..
72	Marquette University School of Medicine, Milwaukee	1	1	1	27	..	1	..	..	..	1	..	6	..	2	2	1	..	..
	CANADA																		
73	University of Alberta Faculty of Medicine, Edmonton	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	1	..	..
75	Dalhousie University Faculty of Medicine, Halifax	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	Queen's University Faculty of Medicine, Kingston	..	1	..	2	..	1	..	..	..	..	..	1	..	..	..	..	..	..
77	University of Ottawa Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
78	University of Western Ontario Faculty of Medicine, London	..	1	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	University of Toronto Faculty of Medicine	..	..	..	5	..	..	..	..	..	..	..	1	..	..	..	..	..	..
80	McGill University Faculty of Medicine, Montreal	1	..	..	3	1	2	1	..	..	..	..	..	1	..	..	2	..	..
81	University of Montreal, Faculty of Medicine	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
82	Laval University Faculty of Medicine, Quebec	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																		
83	Foreign Medical Faculties	1	..	..	1	..	4	2	4	..	1	..	..	2	5	..	..	..	3
84	Extinct Medical Schools	..	4	2	28	..	1	..	..	..	1	1	..	4	..	1	1	..	..
85	Unapproved Medical Schools	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1
86	Schools of Osteopathy	..	..	..	..	3	..	2	..	..	..	..	..	9	..	..	..	..	..
87	TOTALS	99	72	56	1130	84	195	21	134	0	80	60	146	142	90	87	90	83	33
	Marginal Numbers	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

In the 18 years from 1935 to 1952, inclusive, there were 112,234 new additions to the medical profession as determined by the number who received their first license. Figures for each year during this period are presented in table 14. Of the 112,234 in this group, 95,694 were licensed after written examination and 16,540 by endorsement of credentials. The total number of licenses issued in this same period (table 3) was 193,310.

Estimated figures indicate that on Dec. 31, 1952, the total number of physicians in the continental United States was 214,667, of whom 151,363 were estimated to be in private practice. The over-all total includes 6,677 physicians engaged in full-time research and teaching. It also includes 28,366 interns and residents in hospitals and those engaged in hospital administration, 8,166 physicians retired or not in practice, and 20,095 physicians in the government services.

Registration of Physicians, 1904-1952

A tabulation of total numbers of physicians registered for 49 years from 1904 to 1952 inclusive, is given in table 15. This study contains figures pertaining to the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials, and the total registered. The number of physicians registered annually from 1904 to 1933 shows slight fluctuation, except in 1918, when only 4,231 were licensed, the lowest registration in 49 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War I. After 1933 there was an upward trend, except during the years 1940 to 1943 inclusive. The marked increase in 1943 was the result of the acceleration of the medical school curriculum and the efforts on the part of medical educators of the country to maintain a steady flow of physicians for both civilian and medical practice. The greatest number of physicians registered in any year was in 1946. The licensure of medical officers by endorsement of credentials and the original licensure of physicians who had entered military service on completion of the internship accounts in large measure for the increase that almost doubled the registration of the previous year.

In the years since 1946 the numbers registered decreased annually until 1952, although they far exceeded

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico and the Canal Zone	Totals	Marginal Number
1	2	2	3	..	1	1	..	..	..	13	..	16	..	..	4	2	1	41	..	..	..	1	4	..	..	1	2	3	..	..	1	139	53
3	2	4	3	..	5	1	..	..	..	12	1	17	..	..	8	..	1	15	..	4	..	5	4	..	1	7	1	1	..	..	2	129	54
3	2	3	2	..	5	..	1	1	1	12	1	13	2	..	1	2	2	30	..	..	..	2	4	2	1	1	2	2	2	..	6	130	55
5	2	2	1	..	2	..	..	..	2	14	..	19	3	..	6	..	1	18	1	2	..	1	8	2	..	4	1	3	2	..	2	141	56
..	2	..	..	..	1	..	..	..	2	1	..	7	..	..	2	..	..	4	..	..	..	..	..	..	..	1	..	..	1	..	1	35	57
2	..	1	2	..	..	1	..	..	..	1	..	7	..	..	5	..	1	2	..	1	..	..	3	..	..	1	..	2	1	..	..	45	58
1	1	..	..	..	1	..	..	..	..	..	..	..	8	..	2	..	..	..	..	..	..	5	..	..	..	1	1	..	..	..	..	29	59
1	1	2	1	11	6	..	..	..	..	..	1	2	2	..	3	5	..	1	..	2	..	7	6	1	..	..	1	1	..	1	1	118	60
..	..	3	..	2	1	..	..	..	..	2	..	7	5	..	7	..	..	1	..	4	..	3	3	..	..	2	1	..	..	..	..	71	61
4	1	2	1	5	1	..	..	..	..	..	..	..	5	..	4	2	1	..	..	2	..	..	2	..	..	..	1	..	1	..	..	60	62
..	2	..	..	1	..	1	..	..	..	1	1	..	..	..	..	3	..	1	..	.	..	..	1	..	..	..	..	..	..	..	..	18	63
1	1	..	2	1	1	..	2	..	..	..	4	3	1	..	1	2	..	1	..	1	..	..	1	..	..	..	..	1	..	..	..	44	64
..	..	..	..	..	..	2	..	..	..	..	3	1	1	..	2	2	1	3	..	1	..	..	1	..	..	..	..	..	..	..	..	34	65
..	..	1	2	..	1	..	..	..	..	..	1	2	..	..	..	..	2	..	..	..	..	..	..	5	..	..	2	..	..	2	..	34	66
1	6	..	..	..	..	..	..	..	1	3	..	10	..	..	2	..	..	3	..	..	..	..	1	..	6	1	..	..	1	..	..	54	67
4	2	2	1	1	1	..	..	..	..	6	3	8	7	..	5	1	..	1	..	..	..	1	2	..	1	4	2	8	1	..	2	83	68
5	1	2	2	..	..	..	..	..	..	3	..	7	9	..	1	..	..	..	..	..	..	6	6	..	..	4	..	10	..	..	2	75	69
..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	70
..	..	5	3	..	2	1	..	..	..	..	..	3	..	..	4	..	1	3	..	..	..	..	3	1	..	..	1	..	5	..	..	60	71
..	1	3	2	..	1	1	1	..	..	..	1	9	..	2	3	..	2	4	..	..	..	..	1	..	..	1	2	..	8	..	..	85	72
..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	73
1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	6	74
1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	75
..	..	..	1	..	..	..	..	..	1	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	77
..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	78
..	.	1	1	..	1	..	..	..	..	1	..	5	..	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	18	79
3	5	..	2	1	..	..	..	..	3	1	..	12	..	..	5	..	3	..	..	2	..	..	1	..	3	..	..	..	..	..	..	52	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	81
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	82
..	1	1	..	..	..	1	..	..	1	21	1	31	1	..	23	..	..	..	1	..	..	..	..	..	..	3	3	..	1	..	3	115	83
3	1	3	..	1	..	..	..	..	..	1	1	1	1	..	4	3	..	1	..	1	1	..	1	1	1	1	..	..	4	1	1	75	84
..	..	1	..	..	1	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	18	..	..	..	..	..	2	..	..	27	85
..	6	..	..	..	..	..	..	..	1	15	..	5	..	..	7	..	1	1	..	..	..	..	21	..	..	1	..	..	2	1	..	75	86
156	290	180	131	50	143	35	33	16	44	313	56	991	151	15	293	65	88	294	30	58	20	94	291	49	25	111	129	76	107	12	68	7,016	87
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

the prewar totals. The largest registration in the last four years occurred in 1952.

The highest percentage of failures was 21.7% in 1908. Many of the medical schools at that time were proprietary institutions operating for financial returns rather than improvement of the medical curriculum. Beginning in 1915, the percentage of failures began to drop, reaching a low of 5.7% in 1930. Beginning in 1936, the percentage of failures began to rise, reaching another peak of 20.7% in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful after repeated attempts at licensure examinations. While the percentage of failures has been reduced somewhat in more recent years, it still reflects the unsuccessful attempts of foreign-trained physicians, graduates of unapproved medical schools, and schools of osteopathy to secure licensure. Elsewhere in this study, it can be noted that the annual failure rate among graduates of approved medical schools is about 3%. This table again refers to examinations given annually rather than to individuals examined.

Candidates Examined, 1948-1952

The number of candidates examined by licensing boards in five years, 1948 to 1952 inclusive, are recorded in table 16. For each year there is recorded the number who passed and failed licensing examinations. Totals for the five year period and the percentages of candidates who failed are also given.

There were 32,291 examinations given during this period. Of these, 28,549 were successful tests and 3,742, or 11.5%, resulted in failures. New York gave the greatest number of examinations, 3,578. More than 2,000 examinations were also given in California and Illinois, and more than 1,000 were given in Florida, Michigan, Missouri, Ohio, Pennsylvania, and Texas.

Massachusetts had the highest percentage of failures. In this state 67.3% failed. The majority of those who fail in this state represent graduates of unapproved medical schools and schools of osteopathy. The number of failures in this state, however, is decreasing since the unapproved schools whose graduates the licensing board was required by law to examine are no longer in operation. The State Approving Authority has furthermore ruled that students matriculating after Jan. 1, 1941, in

institutions not meeting the standards of this authority will not be eligible for licensure.

New York had 50.5% failures in five years and California 35.6%. These states examine a considerable number of graduates of foreign medical schools, many of whom do not pass their first examination. Regulations permitting certain graduates of unapproved and osteopathic schools to the licensure examination in New York also contributed to its high percentage of failures.

The annual percentage of failures for all boards in the five year period ranged from 10.8 to 12.5. Four states had more than 20% failures, 5 states more than 10%, 11 states more than 5%, and 25 states less than 5%. Kentucky, Missouri, Tennessee, Washington, and Wyoming had no failures in five years.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1952*

	Examination	Reciprocity and Endorsement	Total
Alabama	59	8	67
Arizona	7	4	11
Arkansas	78	1	79
California	402	133	535
Colorado	32	8	40
Connecticut	11	83	94
Delaware	9	3	12
District of Columbia	7	73	80
Florida	123	..	123
Georgia	135	5	140
Idaho	10	4	14
Illinois	424	30	454
Indiana	173	6	179
Iowa	93	12	105
Kansas	92	2	94
Kentucky	119	3	122
Louisiana	204	0	204
Maine	10	12	22
Maryland	232	22	254
Massachusetts	22	156	178
Michigan	83	23	106
Minnesota	180	19	199
Mississippi	83	2	85
Missouri	244	13	257
Montana	8	1	9
Nebraska	92	0	92
Nevada	0	0	0
New Hampshire	6	18	24
New Jersey	48	88	136
New Mexico	5	1	6
New York	274	653	927
North Carolina	140	24	164
North Dakota	15	2	17
Ohio	365	53	418
Oklahoma	66	4	70
Oregon	29	10	39
Pennsylvania	313	129	442
Rhode Island	14	14	28
South Carolina	63	1	64
South Dakota	6	3	9
Tennessee	203	1	204
Texas	306	12	318
Utah	23	3	26
Vermont	6	7	13
Virginia	125	15	140
Washington	57	16	73
West Virginia	11	4	15
Wisconsin	118	8	126
Wyoming	1	1	2
Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico	42	27	69
Total	5,168	1,717	6,885

The foregoing figures represent examinations given and not persons examined. A candidate who fails more than once in a given year is counted as one failure, but should he again fail in a succeeding year this fact is computed among the failures for that year. In compiling the tabulations in this study, a successful candidate securing a license in more than one state in a given year is counted in both states and likewise counted if he passed at examinations in later years. The totals in this table give only a fair approximation of the number of physicians added to the profession after written examination during the last five years. Table 12 gives the exact number of physicians who constitute new additions to the medical profession.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1952*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	10	12	22
New Hampshire	6	18	24
Vermont	6	7	13
Massachusetts	22	156	178
Rhode Island	14	14	28
Connecticut	11	83	94
Total	69	290	359
Middle Atlantic			
New York	274	653	927
New Jersey	48	88	136
Pennsylvania	313	129	442
Total	635	870	1,505
East North Central			
Ohio	365	53	418
Indiana	173	6	179
Illinois	424	30	454
Michigan	83	23	106
Wisconsin	118	8	126
Total	1,163	120	1,283
West North Central			
Minnesota	180	19	199
Iowa	93	12	105
Missouri	244	13	257
North Dakota	15	2	17
South Dakota	6	3	9
Nebraska	92	0	92
Kansas	92	2	94
Total	722	51	773
South Atlantic			
Delaware	9	3	12
Maryland	232	22	254
District of Columbia	7	73	80
Virginia	125	15	140
West Virginia	11	4	15
North Carolina	140	24	164
South Carolina	63	1	64
Georgia	135	5	140
Florida	123	0	123
Total	845	147	992
East South Central			
Kentucky	119	3	122
Tennessee	203	1	204
Alabama	59	8	67
Mississippi	83	2	85
Total	464	14	478
West South Central			
Arkansas	78	1	79
Louisiana	204	0	204
Oklahoma	66	4	70
Texas	306	12	318
Total	654	17	671
Mountain			
Montana	8	1	9
Idaho	10	4	14
Wyoming	1	1	2
Colorado	32	8	40
New Mexico	5	1	6
Arizona	7	4	11
Utah	23	3	26
Nevada	0	0	0
Total	86	22	108
Pacific			
Washington	57	16	73
Oregon	29	10	39
California	402	133	535
Total	488	159	647
Territories and Possessions			
Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico	42	27	69
Totals	5,168	1,717	6,885

Graduates of Approved Schools and Others Registered, 1922-1952

In table 17 the numbers of physicians registered are grouped in two categories, namely, graduates of approved medical schools and others. In the computation

of these figures, schools rated as class A and B prior to 1928 by the Council on Medical Education and Hospitals of the American Medical Association are classified as approved. In 1928 the classification A, B, and C by the Council was discontinued, and a list of approved medical schools has since been maintained. In the column headed "Others" are included graduates of foreign faculties of medicine, class C graduates, osteopaths given recognition by medical licensing boards, and graduates of schools not approved by the Council.

In 1952 there were 13,245 candidates registered, of whom 12,198 or 92.1% represented graduates of approved schools and 1,047 or 7.9% were in the second group. In the 31 years recorded in this table, 286,200 were registered, including 257,923 (90.2%) graduates of approved medical schools, and 28,277 (9.8%) others.

Graduates of Unapproved Schools Registered, 1948-1952

Recorded in table 18 are data regarding graduates of institutions that have not been approved by the Council on Medical Education and Hospitals of the American Medical Association. Figures are given for those licensed after written examination and those licensed by endorsement of credentials. The table also includes a column combining the figures for these two groups. They represent graduates of five unapproved schools recently in operation, all but one of which is closed. The latter institution has obtained the status of an approved school. There were 545 graduates of unapproved medical schools registered from 1948 to 1952 inclusive, 441 by examination and 104 by endorsement of credentials.

Florida, Illinois, Massachusetts, New York, and Texas licensed the greatest number of graduates of unapproved medical schools in the United States. Twenty-eight boards were represented; 11 registered these candidates after examination and 11 on endorsement of credentials, while 6 licensed unapproved graduates by both examination and reciprocity.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession, 1935-1952*

	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,965
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
1951	4,985	1,288	6,273
1952	5,168	1,717	6,885
Totals	95,694	16,540	112,234

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1948-1952

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery, or both, by 18 licensing boards from 1948 to 1952 inclusive is given in table 19. There have been 841 such persons registered, 606 by examination and 235 without written examination. Three states admitted these graduates after examination, and two by endorsement, while 13 licensed them after both methods. Following is a summary of the actions and regulations of these 18 boards providing for the licensing of osteopaths by the medical examining board.

Alabama registered a graduate of a school of chiropractic. In Colorado an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may obtain the right to practice medicine or surgery or both according to the type of examination taken. Osteopaths in Delaware may be licensed as osteopathic physicians. The District of Columbia grants osteopaths the privilege of practicing surgery. Under an amendment to the medical practice act in 1945, osteopaths in Indiana are permitted to practice medicine and surgery. Persons who were licensed in osteopathy before 1945 are authorized to practice osteopathy, surgery, and obstetrics. In Massachusetts the medical practice act by definition includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic physician. A law passed in Nebraska in 1943 provided that osteopaths might make application for a license to practice medicine and surgery by examination if application was made prior to July 1, 1948. In New Hampshire osteopaths are granted the right to practice medicine and surgery.

New Jersey provides that osteopaths licensed prior to Nov. 1, 1941, who have served for a period of two years as an intern or resident surgeon in an approved osteopathic or medical hospital, or have completed a post-

TABLE 15.—*Registration of Physicians, 1904-1952*

Year	Examined	Passed	Percentage Failed	Reciprocity or Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,002	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236
1951	6,473	5,716	11.7	6,225	11,941
1952	7,028	6,229	11.3	7,016	13,245

graduate course of two years in a college of osteopathy or medicine approved by the board, or have had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics, and surgery. If successful, they can obtain a license to practice medicine and surgery.

In New York a law approved April 10, 1946, provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics, and biological products, or any applicant who has met or shall meet all the preliminary and professional requirements as of Sept. 1, 1936, and has satisfactorily passed or shall so pass the regular licensing examination shall be granted the right to practice medicine without limitation.

Osteopaths in Ohio who obtained their license under an act passed in 1943 are given the right to practice osteopathic medicine and surgery. In Oregon osteopaths are granted the right to practice in the subjects covered by the examination. In South Dakota, osteopaths may be issued a license to practice osteopathic medicine, surgery, and obstetrics, which is an unrestricted license. Texas issues only one license, which is unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and to perform surgery with instruments. The Wisconsin law as amended in 1950 provides that an osteopath licensed in Wisconsin may obtain a license to practice medicine and surgery by completing a refresher course in *materia medica* and pharmacology consisting of not less than 64 hours of lecture and 60 hours of laboratory work and by passing an examination in these subjects. Osteopaths not licensed in the state may apply to take the same examination as physicians; if successful, they will be granted licenses to practice medicine and surgery. In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificates issued to all applicants shall be deemed licenses to practice medicine in all branches in which the applicant has taken an examination.

TABLE 16.—*Candidates Examined, 1948-1952*

	1948		1949		1950		1951		1952		Totals for Five Years		
	P	F	P	F	P	F	P	F	P	F	P	F	% F
Alabama	16	2	46	1	39	0	60	2	66	1	227	6	2.6
Arizona	17	0	22	0	8	1	14	0	14	0	75	1	1.3
Arkansas	59	0	52	0	74	0	83	4	79	0	347	4	1.1
California	493	36	492	57	543	37	500	54	558	51	2,586	235	8.3
Colorado	72	2	78	0	76	0	84	1	85	0	395	3	0.7
Connecticut	32	7	29	15	29	19	34	16	17	21	141	78	35.6
Delaware	20	0	21	0	23	0	13	1	17	2	94	3	3.1
Dist. of Columbia	33	3	30	1	24	3	27	2	15	0	129	9	6.5
Florida	301	26	308	19	325	46	374	53	422	51	1,730	195	10.1
Georgia	131	1	109	4	147	1	147	0	149	0	683	6	0.8
Idaho	51	0	38	1	1	0	8	0	10	0	108	1	0.9
Illinois	512	44	367	67	399	60	419	91	510	183	2,207	445	17.1
Indiana	99	2	98	4	112	3	116	3	173	2	598	14	2.3
Iowa	67	0	57	0	86	1	81	0	118	2	409	3	0.7
Kansas	67	0	99	1	96	1	92	0	93	4	447	6	1.3
Kentucky	60	0	86	0	88	0	104	0	124	0	462	0	0.0
Louisiana	182	0	164	1	190	1	217	0	218	0	971	2	0.2
Maine	31	3	25	4	19	1	15	6	15	3	105	17	13.9
Maryland	185	8	172	17	183	10	174	14	213	13	927	62	6.2
Massachusetts	65	111	41	92	26	71	35	79	31	55	198	408	67.3
Michigan	181	0	164	0	195	0	221	1	246	2	1,007	3	0.3
Minnesota	212	1	184	0	201	0	166	0	220	0	983	1	0.1
Mississippi	47	0	35	5	64	1	77	0	83	0	306	6	1.9
Missouri	238	0	198	0	206	0	230	0	238	0	1,110	0	0.0
Montana	10	1	8	0	5	0	3	0	8	0	34	1	2.9
Nebraska	84	16	52	4	96	3	96	6	93	4	421	33	7.2
Nevada	3	1	4	1	0	0	0	0	0	0	7	2	22.2
New Hampshire	10	1	7	1	6	1	6	3	7	2	36	8	18.2
New Jersey	90	22	76	9	41	11	54	11	48	6	309	59	13.3
New Mexico	3	0	4	1	2	0	2	0	3	0	14	1	6.7
New York	426	371	411	397	290	397	339	337	305	305	1,771	1,807	50.5
North Carolina	112	0	88	0	97	1	125	1	141	0	563	2	0.3
North Dakota	30	0	24	0	35	3	26	8	25	1	140	12	7.8
Ohio	322	7	262	6	326	19	371	46	371	30	1,652	108	6.1
Oklahoma	59	0	47	1	82	0	66	0	53	0	307	1	0.3
Oregon	48	0	47	4	38	2	42	0	29	1	204	7	0.5
Pennsylvania	448	6	396	3	326	2	277	1	334	4	1,781	16	0.9
Rhode Island	21	0	15	1	12	3	12	0	32	1	92	5	1.0
South Carolina	57	0	43	1	59	0	63	0	64	0	286	1	0.3
South Dakota	27	0	10	0	20	0	23	3	15	0	95	3	3.1
Tennessee	150	0	177	0	142	0	155	0	204	0	828	0	0.0
Texas	262	33	184	10	277	16	305	8	317	20	1,345	87	6.1
Utah	18	0	30	0	29	0	24	1	26	0	127	1	0.8
Vermont	16	0	11	4	15	1	4	0	9	0	55	5	8.3
Virginia	136	4	109	5	138	1	168	2	149	29	700	41	5.5
Washington	110	0	72	0	60	0	54	0	58	0	354	0	0.0
West Virginia	55	0	61	0	42	0	26	0	18	1	202	1	0.5
Wisconsin	182	7	109	0	130	0	132	0	150	0	703	7	0.9
Wyoming	0	0	1	0	2	0	4	0	1	0	8	0	0.0
U. S. Territories and Possessions	54	5	56	7	57	6	48	3	55	5	270	26	8.7
Total Examined	6,624		5,963		6,203		6,473		7,028		32,291		
Passed	5,904		5,219		5,481		5,716		6,229		28,549		
Failed	720		744		722		757		799		3,742		
Percentage Failed	10.8		12.5		11.6		11.7		11.3		11.5		

TABLE 17.—*Graduates of Approved Schools and Others Registered, 1922-1952*

Year	Graduates of Approved Schools		Others		
	Number	Per Cent of Total	Number	Per Cent of Total	Totals
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
1951	11,027	92.3	914	7.7	11,941
1952	12,198	92.1	1,047	7.9	13,245
Totals	257,923	90.2	28,277	9.8	286,200

Preprofessional Requirements of Licensing Boards

The minimum requirement of the Council on Medical Education and Hospitals and the Association of American Medical Colleges for admission to approved medical schools beginning in 1918 had been two years of college training. In 1938 both these agencies recommended that at least three years of college work be required of all candidates for admission. In December, 1951, the Council's requirements were increased to three years of college training to become effective for students entering medical school after Jan. 1, 1953. The present requirements as stated in the Council's "Essentials of an Acceptable Medical School" are as follows:

1. Collegiate training in preparation for the study of medicine should provide the opportunity for a good general education, including the attainment of competence in English. It should include theoretical and laboratory courses in physics, biology, and inorganic and organic chemistry. At the present time the minimum requirement for admission to approved medical schools is three years of college training for the average student. For most students, four years is recommended in order to provide an opportunity to gain a broad educa-

tional experience. Rarely, a school will be justified in admitting a superior student under exceptional conditions after two years of college work.

2. Since it cannot in general be assumed that all who have satisfied these requirements merely in terms of hourly credits are fitted for the study of medicine, it is desirable that qualitative standards with reference to academic performance, character, motivation, and health also be imposed.

3. As a rule candidates should have received their preliminary education in institutions approved by accrediting agencies acceptable to the Council. Exception to this rule may be made in the case of applicants who have demonstrated superior ability. For the convenience of admitting officers, the Council has compiled a list of colleges of arts and sciences approved by regional educational associations.

present graduates and three years for graduates after Jan. 1, 1955. Nine states and Puerto Rico specify a three year college requirement.

All 79 medical and basic science schools in the United States require three or more years of premedical study. Five of the Canadian schools have a similar requirement. Nine schools, Georgetown, Chicago Medical School, Johns Hopkins, Tufts, New York Medical College, Cornell, Vanderbilt, Montreal and Laval, require a bachelor's degree. Georgetown, however, requires only three years of college work for veterans. Cornell and Vanderbilt will accept students with three years of college work,

TABLE 18.—*Graduates of Unapproved Medical Schools Registered by Medical Boards, 1948-1952*

	Examination						Reciprocity and Endorsement						Combined Totals
	1948	1949	1950	1951	1952	Totals	1948	1949	1950	1951	1952	Totals	
Arizona	..	..	..	..	..	..	1	1	..	2	..	4	4
Arkansas	..	..	1	..	..	1	..	..	..	..	..	..	1
California	..	..	2	..	..	2	..	..	5	..	..	5	7
Connecticut	..	..	..	..	..	..	..	..	..	..	1	1	1
District of Columbia	..	..	..	..	..	..	..	..	1	..	..	1	1
Florida	25	25	16	9	7	82	..	..	..	..	..	..	82
Georgia	..	1	1	1	..	3	..	3	..	1	1	5	8
Illinois	56	41	5	2	..	104	1	..	..	..	..	1	105
Kentucky	..	2	..	..	..	2	..	..	..	..	..	..	2
Maine	..	..	..	..	..	..	..	2	1	1	1	5	5
Maryland	..	..	..	..	5	5	..	..	..	..	..	..	5
Massachusetts	26	11	5	4	..	46	..	..	..	..	..	..	46
Michigan	..	..	..	..	..	..	..	..	1	1	1	3	3
Mississippi	3	..	1	1	..	5	..	..	..	..	..	..	5
Missouri	..	..	..	..	..	..	..	..	3	..	1	4	4
Nebraska	..	..	..	..	..	..	1	..	..	..	..	1	1
Nevada	..	..	..	..	..	..	..	..	..	..	2	2	2
New York	60	94	7	4	1	166	..	..	..	..	1	1	167
North Carolina	..	..	3	..	..	3	..	..	..	..	..	..	3
Ohio	1	1	1	..	..	3	..	..	..	..	..	..	3
Pennsylvania	..	..	1	1	2	4	..	..	..	..	1	1	5
Tennessee	..	..	..	..	..	..	..	1	..	..	..	1	1
Texas	..	..	..	..	..	..	..	..	2	45	18	65	65
Virginia	1	3	..	..	..	4	..	..	..	..	..	..	4
Washington	1	1	..	..	..	2	..	..	..	..	..	..	2
West Virginia	..	2	..	..	1	3	..	..	..	..	..	..	3
Wisconsin	..	..	..	..	..	..	..	..	..	1	2	3	3
Territories and Possessions	..	3	2	1	..	6	..	..	..	1	..	1	7
Totals	173	184	45	23	16	441	3	7	13	52	29	104	545

TABLE 19.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1948-1952*

	Examination						Reciprocity and Endorsement						Combined Totals
	1948	1949	1950	1951	1952	Totals	1948	1949	1950	1951	1952	Totals	
Alabama	..	..	..	..	1	1	..	..	..	..	..	..	1
Colorado	5	5	8	10	5	33	..	..	..	..	3	3	36
Connecticut	..	1	4	1	1	7	..	..	..	..	..	..	7
Delaware	..	..	..	1	..	1	..	1	..	1	2	4	5
District of Columbia	..	..	1	..	..	1	2	1	1	1	..	5	6
Indiana	..	3	3	..	7	13	..	1	..	9	9	19	32
Massachusetts	2	..	..	2	..	4	5	3	3	6	6	23	27
Nebraska	..	1	..	..	..	1	..	..	..	..	..	..	1
New Hampshire	..	..	..	..	..	..	6	4	1	..	1	12	12
New Jersey	3	5	7	2	11	28	3	1	2	6	15	27	55
New York	34	11	34	45	36	160	13	2	3	..	5	23	183
Ohio	21	24	28	46	47	166	12	4	8	8	7	39	205
Oregon	1	..	..	..	..	1	8	5	..	..	1	14	15
South Dakota	..	..	1	..	..	1	..	..	1	1	..	2	3
Texas	33	15	35	37	41	161	1	9	5	15	21	51	212
Virginia	1	..	1	..	..	2	1	..	..	..	1	2	4
Wisconsin	2	1	4	11	8	26	6	1	..	..	2	9	35
Wyoming	..	..	..	..	..	..	..	..	1	..	1	2	2
Totals	102	66	126	155	157	606	57	32	25	47	74	235	841

4. Candidates who have completed three years of collegiate instruction and present evidence of having accomplished work of distinction in one or more fields of learning, but who lack credit in any or all of the required subjects, may be admitted on passing examinations in these subjects.[3]

All state licensing boards with the exception of Colorado (table 20) require that an applicant for licensure present evidence of having completed two years of college. The Colorado State Board reports that the premedical requirement for licensure is not specified by law. California initiated a two year requirement in 1951 for

provided their colleges will grant them a bachelor's degree on the successful completion of the first year of medical school.

Of the freshman students who entered medical school in the United States for the session 1951-1952, 5,249 or 73.1%, had baccalaureate degrees; 408, or 5.7%, had attended college four years but did not receive a degree; 1,437, or 20.3%, had had three years of college work, and only 63, or 0.9%, had had only two years of college.

3. Certain state boards of medical licensure, however, require completion of regular college courses in all subjects.

Professional Educational Requirements of Licensing Boards

The medical practice acts or board regulations of several state medical licensing boards specify the length of the medical school course. In other states, the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Education and Hospitals of the American Medical Association or for membership in the Association of American Medical Colleges, or both, is the regulation for licensure. Table 21 outlines the requirement of each licensing board. This table does not record the internship which is a requirement for licensure by 33 boards.

Approval of Medical Schools

Seven licensing boards maintain their own list of approved medical schools in the United States and Canada. Twenty-four boards require applicants for licensure from medical schools in the United States and Canada to be graduates of medical schools approved by the Council on Medical Education and Hospitals of the American Medical Association, three boards require that the schools be members of the Association of American Medical Colleges, and 21 boards require that schools be approved by the Council and be members of the College Association. In 30 instances, the requirement is specifically prescribed by law; 14 boards report the requirement is by formal regulation, while 11 boards indicate it is an informal policy.

TABLE 20.—*Requirements of Premedical Training by Medical Licensing Boards*

Two Years or More of College

Alabama	Massachusetts	South Carolina [2]
Arizona	Michigan [2]	South Dakota
Arkansas	Minnesota	Tennessee [2]
California	Mississippi	Texas
Colorado [1]	Missouri	Utah
Connecticut	Montana	Vermont
Delaware	Nebraska	Virginia
District of Columbia	Nevada [2]	Washington
Florida [2]	New Hampshire	West Virginia
Georgia	New Jersey	Wisconsin [2]
Idaho	New Mexico	Wyoming
Illinois	New York	Alaska
Indiana	North Carolina [2]	Canal Zone
Iowa [2]	North Dakota	Guam
Kansas	Ohio	Hawaii
Kentucky	Oklahoma	Puerto Rico [2]
Louisiana	Oregon	Virgin Islands
Maine	Pennsylvania	
Maryland [2]	Rhode Island	

1. Not specified by law.
2. Three year college requirement.

Required Internships

Five medical schools in the United States and five medical schools in Canada require their students to serve an internship. These schools are listed in table 22. All except one of these schools withhold the degree of Doctor of Medicine until the year of internship has been served. Duke University issues the degree at the end of the four year medical course but obtains from each student a signed agreement that he will spend two years in training in a hospital or laboratory before entering practice. The requirement was discontinued by the University of Minnesota during the current month.

One year of internship as a prerequisite to licensure is required by the licensing boards of 27 states in the United States and 6 of the territories and possessions. The internship requirement was instituted during the past year by South Carolina. Arizona reports it requires a straight internship. Eleven boards specify that the internship must be a rotating service. Oregon, which formerly required a rotating service, now indicated that either a rotating or a straight service is acceptable. Michigan, which requires a rotating service, will also accept a 24 month mixed or straight internship. New Jersey specifies that a two year residency in a specialty or one year of postgraduate work will meet the requirements of a rotating internship service. Alaska will accept active practice for four years in lieu of the internship requirement. Those licensing boards that require an internship for license are listed in table 23.

Licensure Requirements for Interns and Residents in Hospitals

In the majority of states, physicians serving internships are not required to be licensed in the state in which the hospital where they are interning is located. Georgia, Wyoming, and Puerto Rico have this requirement. New Jersey permits a service of two years and Florida a three year service before licensure, while Minnesota reports that licensure is not required if the internship is being served for the M.D. degree of the University of Minnesota. Seven boards that require an intern to register with the board are California, Colorado, Delaware, District of Columbia, Massachusetts, Virginia, and West Virginia.

Nineteen states and Puerto Rico require that physicians serving as residents in hospitals must be licensed in the state. In Connecticut and Maryland it is not a requirement of the licensing board but is customarily required by hospitals in those states. Fifteen boards, while not requiring licensure, specify that licensure is recommended; they may grant temporary certificates during the period of residency or for a stipulated time, require residents to register with the board, or will permit service for a definite period without licensure. The regulations of each of the licensing boards that exact some requirement of those engaged in intern or residency training are given in table 24.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of state licensing boards for written examinations for medical licensure and meetings for the issuance of licenses by reciprocity and/or endorsement of credentials are tabulated in table 25. Examination dates and reciprocity meetings in most states are scheduled at frequent intervals to assist physicians to commence the practice of medicine without delay. In those states requiring a basic science certificate for licensure, dates of these examinations are arranged to coincide closely with the examination and meeting dates of the boards of examiners in the basic sciences. In other states temporary permits are granted enabling physicians to begin the practice of medicine immediately. The next section of this report gives data pertaining to the issuance of temporary permits.

Temporary Permits and Limited Licenses

Twenty-six boards provide for the issuance of temporary permits or limited licenses or both. These states, the length of the validity of this special registration, and the number of permits or limited licenses granted during the last calendar year are shown in table 26. There were 825 temporary permits issued by 19 boards and 207

limited licenses by 8 boards. Two boards did not report figures, while no permits were issued during the year in Georgia.

Medical License Fees

Table 27 lists for each state, territory, and outlying possession the fee charged by the medical licensing board for registration by examination and also by reciprocity or endorsement of credentials. The examination fee tends to be uniform, the majority of the boards charging a fee of $25. The fee for a license without examination varies from $20 to $200. Five states—Michigan, New Hampshire, North Carolina, Tennessee and Washington—reported an increase in the fee charged for the written examination, and five states—Kentucky, Michigan, New Hampshire, North Carolina and Washington—an increase in the fee charged for a license without examination. Four states reported the minimum reciprocal fee but specified that the fee for a license by this procedure would be the same as that exacted by the reciprocating state if more than the minimum. Five states have a lower fee for those being certified on the basis of the certificate of the National Board of Medical Examiners than for candidates licensed by reciprocity.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice acts for the acceptance of credentials issued by the federal government as a basis for licensure without examination. Eleven licensing boards have indicated that in their discretion they may accept such credentials under varying regulations. Some boards limit recognition to commissioned officers of the Army and Navy only. These states are Alabama, California, Illinois, Iowa, Oregon, Pennsylvania, South Carolina, Texas, Utah, Virginia, and Wisconsin.

Annual Registration

Thirty-eight boards require physicians to register their licenses annually or biennially. In table 28 are listed the licensing boards that exact this requirement and the fee charged for such registration. South Dakota initiated this requirement in 1952. Some of the states require such registration whether or not physicians reside in the state.

TABLE 21.—*Professional Educational Requirements by Medical Licensing Boards*

	Length of Medical School Academic Year					Total Time Spent in Medical School (Registration to Graduation)					
	Weeks	Months	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.†	Not Specified by Board	Weeks	Months Annual	Years	M.D. Degree	Same as Approved Medical Schools	Same as A.A.M.C. and C.M.E. and H.†
Alabama	..	9	..	..	..	..	..	4	..	..	..
Arizona	..	9	..	..	..	..	..	4	..	..	..
Arkansas	..	9	..	..	..	..	36	..	..	..	..
California	..	..	..	..	X	..	..	4	..	..	..
Colorado	..	..	..	..	X	..	..	..	X	..	..
Connecticut	32	..	..	..	..	32	..	4	..	..	..
Delaware	..	..	..	..	X	..	28	..	X	..	..
District of Columbia	..	9	..	..	..	..	36	..	..	..	..
Florida	..	..	..	X	..	..	..	..	..	..	X
Georgia	..	9	..	..	..	..	..	4	..	..	..
Idaho	..	9	..	..	..	..	..	4	..	..	..
Illinois	..	9	..	..	..	..	40	..	..	..	..
Indiana	..	8	..	..	..	..	..	4	..	..	..
Iowa	..	9	..	..	..	..	..	4	..	..	..
Kansas	..	9	..	..	..	..	..	4	..	..	..
Kentucky	..	9	..	..	..	..	..	4	..	..	..
Louisiana	..	..	..	X	..	..	..	..	X	..	X
Maine	..	9	..	..	..	..	..	4	..	..	..
Maryland	..	..	..	X	..	..	..	..	..	..	X
Massachusetts	32	..	..	..	..	..	..	4	..	..	..
Michigan	..	9	..	..	..	..	36	4	..	..	..
Minnesota	36	..	..	..	..	..	..	4	..	..	..
Mississippi	32	..	..	..	..	..	..	4	..	..	..
Missouri	32	..	..	..	..	..	..	4	..	..	..
Montana	..	9	..	..	..	..	..	4	..	..	..
Nebraska	..	9	..	..	..	..	..	4	..	..	..
Nevada	..	9	..	..	..	..	..	4	..	..	..
New Hampshire	..	9	..	..	..	..	..	4	..	..	..
New Jersey	..	8	..	..	..	..	..	4	..	..	..
New Mexico	..	..	X	..	..	..	..	..	X	X	..
New York	..	8	..	..	..	..	..	4	..	..	..
North Carolina	..	..	..	..	X	..	..	4	..	..	..
North Dakota	..	9	..	..	..	..	..	4	..	..	..
Ohio	..	9	..	..	..	..	..	4	..	..	..
Oklahoma	..	..	..	..	X	..	..	..	..	X	..
Oregon	..	8	..	..	..	..	32	4	..	..	..
Pennsylvania	32	..	..	..	..	..	..	4	..	..	..
Rhode Island	..	..	..	..	X	..	..	..	X	..	..
South Carolina	..	..	..	X	..	..	..	4	..	..	..
South Dakota	..	..	..	..	X	..	..	4	..	..	..
Tennessee	..	9	..	..	..	..	36	..	..	..	..
Texas	..	8	..	..	..	..	..	4	..	..	..
Utah	..	9	..	..	..	..	..	4	..	..	..
Vermont*	..	..	..	..	..	..	..	4	..	..	..
Virginia	..	8	..	..	..	..	..	4	..	..	..
Washington	..	..	..	X	..	..	..	4	..	..	X
West Virginia	..	..	..	..	X	..	..	..	X	..	X
Wisconsin	..	..	..	X	..	..	..	4	..	..	X
Wyoming	..	..	..	X	..	..	..	..	..	..	X
Alaska	..	..	..	X	..	..	..	..	..	..	X
Canal Zone	..	10	..	..	..	..	..	4	X	..	..
Guam	..	9	..	..	..	..	..	4	..	..	..
Hawaii	..	..	..	..	X	..	..	..	..	..	X
Puerto Rico	..	..	..	X	..	..	..	..	..	..	X
Virgin Islands	..	..	..	..	X	..	..	..	X	..	X

* Length of medical school academic year, 900 hours.
† Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
X Implies requirements are those of the accrediting agencies.

The fee ranges from $1 to $10. Five states have a nonresident fee. In Florida physicians are required to register with the State Board of Health, while in the Virgin Islands there is a fee of $50 exacted by the municipality. Missouri, New York, and West Virginia require biennial registration.

TABLE 22.—*Medical Schools Requiring an Internship*

United States
College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Chicago Medical School
Duke University School of Medicine [1]
Canada
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Ottawa Faculty of Medicine
Laval University Faculty of Medicine
University of Montreal Faculty of Medicine

1. Degree not withheld until internship completed.

Licensure of Foreign-Trained Physicians

In February, 1950, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges first published a list of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools. This is offered as an advisory list for the use of any agency or organization that finds it helpful. In the preparation of this initial list and its three subsequent revisions, these agencies have had the cooperation of an Advisory Committee on Foreign Medical Credentials, made up of a large group of outstanding persons representing medical education, educational foundations, licensing bodies, various governmental agencies, and other organizations interested in the problems of foreign-trained physicians.

The current list, revised to February, 1953, is contained in table 29. It has been emphasized that the list is a tentative one to which other schools may be added as information is collected that justifies their inclusion. Because the list is acknowledged to be a tentative one, the position of the Council with respect to schools not named in the list is that they neither approve nor disapprove of them. Therefore, the credentials of graduates of schools not listed must be evaluated by those other agencies, organizations, or institutions to whom graduates of the institutions apply for recognition. Fifty schools in 14 countries are included in the present listing. The latest addition has been the Peiping Union Medical College, Peiping, China.

TABLE 23.—*Medical Licensing Boards Requiring a One Year Internship**

Alabama	Nevada	Vermont
Arizona [1]	New Hampshire	Washington [2]
California	New Jersey [2,4]	West Virginia
Colorado	North Dakota [2]	Wisconsin
Delaware [2]	Oklahoma [2]	Wyoming
District of Columbia	Oregon	Alaska [4,5]
Idaho	Pennsylvania [2]	Canal Zone
Illinois [2]	Rhode Island [2]	Guam
Iowa [2]	South Carolina	Hawaii
Kentucky	South Dakota	Puerto Rico [2]
Michigan [2,3]	Utah	Virgin Islands

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.

1. Straight internship required.
2. Internship must be a rotating service.
3. Twenty-four month mixed or straight internship acceptable.
4. Two year residency in a specialty or one year of postgraduate work accepted.
5. Active practice for four years accepted in lieu of internship.

Twenty-six licensing boards have reported the acceptance of this list in the consideration of applicants for licensure. Sixteen of these boards stipulate that recognition is limited to graduates of schools on the list. Iowa specifies that graduates of foreign medical faculties after Jan. 1, 1940, are not eligible unless they have graduated from a school on the published list or have done some special work in an approved medical school or hospital in the United States. Maryland accepts graduates of these schools after completion of a one year internship or residency in an approved hospital provided they obtain two letters of recommendation as to their professional ability and moral character from the hospital authorities, while Ohio will not accept for licensure foreign graduates after 1943 unless they are graduates of schools on the published list. The remaining seven boards (Connecticut, Florida, Maine, Nebraska, New Hampshire, Pennsylvania, and West Virginia) have reported they accept the

TABLE 24.—*States Exacting Licensure, Registration, or Other Requirements of Interns and Residents in Hospitals*

Requirements for Interns

Licensure Required

Florida [2]	Minnesota [3]	Wyoming
Georgia	Nevada [4]	Puerto Rico
	New Jersey [5]	

Required to Register with Licensing Board

California	Delaware [7]	Virginia [9]
Colorado [1]	District of Columbia [8]	West Virginia [6]
	Massachusetts	

1. Registration with licensing board required annually not to exceed four years.
2. Must register with State Board of Health and may serve for three years without licensure.
3. Not required if internship is being served for M.D. degree of University of Minnesota.
4. Temporary certificate for one year.
5. May serve for two years without licensure.
6. Graduates of foreign medical schools required to obtain permission from licensing board.
7. Must register with Medical Council of Delaware.
8. Hospital must notify licensing board.
9. Graduates of unapproved medical schools may serve three years if permission is secured from licensing board.

Requirements for Residents in Hospitals

Licensure Required

Arkansas	Louisiana	South Carolina
California	Maryland [2]	Texas
Connecticut [2]	Minnesota	Washington
Georgia	Mississippi	Wisconsin
Idaho	New Mexico	Wyoming
Indiana	Ohio [14]	Puerto Rico
Iowa	Pennsylvania	

Other Requirements

Colorado [1]	Maine [8]	North Carolina [10]
Delaware [3]	Massachusetts [1]	North Dakota [7]
District of Columbia [4]	Michigan [15]	Oklahoma [11]
Florida [5]	Nevada [8]	Virginia [12]
Illinois [6]	New Jersey [9]	West Virginia [13]

1. Registration with licensing board required.
2. May be required by hospitals.
3. Registration with Medical Council of Delaware required.
4. Hospitals must notify licensing board.
5. Must register with State Board of Health and may serve for three years without licensure.
6. Temporary certificate issued for postgraduate or resident training for non-citizens or persons who do not expect to practice in Illinois.
7. Licensure recommended.
8. Temporary certificate for one year.
9. May serve for two years without licensure.
10. Limited license granted.
11. Temporary permit granted for one year; may be renewed for two additional years.
12. Graduates of unapproved medical schools may serve three years if permission is secured from licensing board. Such graduates serving approved fellowships may serve five years at the discretion of the licensing board.
13. Foreign graduates required to obtain permission from licensing board.
14. If they assume full responsibility and receive pay for services.
15. Temporary permit renewable for five years.

TABLE 25.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examinations Held	Licenses by Reciprocity or Endorsement Issued
Alabama	Annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	Semi-annually	Continuously
California	Quarterly	Five meetings annually
Colorado	Semi-annually	Quarterly
Connecticut	March, July and Nov.	Continuously
Delaware	Semi-annually	Semi-annually
District of Columbia	Semi-annually	Quarterly
Florida	Semi-annually	No reciprocity
Georgia	June and October	June and October
Idaho	Semi-annually	Semi-annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Every 6 weeks to 2 months
Iowa	June and December	Every 2 months
Kansas	Semi-annually	Semi-annually
Kentucky	Semi-annually	Continuously
Louisiana	June and December	June and December
Maine	Three, annually	Three, annually
Maryland	Twice annually	Continuously
Massachusetts	January and July	Monthly except August
Michigan	June and October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	June	June and December
Missouri	Three, annually	Periodically
Montana	Semi-annually	Semi-annually
Nebraska	Annually	Continuously
Nevada	Four, annually	Four, annually
New Hampshire	Twice annually	Twice annually
New Jersey	June and October	Monthly except August
New Mexico	Twice annually	Twice annually
New York	Jan., June and Oct.	Continuously
North Carolina	Annually	Five times annually
North Dakota	January and July	Semi-annually
Ohio	June and December	Quarterly
Oklahoma	Annually	Quarterly
Oregon	January and July	Quarterly
Pennsylvania	January and July	Monthly
Rhode Island	Quarterly	Four regular and special meetings
South Carolina	Twice annually	Monthly
South Dakota	Twice annually	Twice annually
Tennessee	Quarterly	Continuously
Texas	Twice annually	Four meetings annually
Utah	Annually	3 or 4 meetings annually
Vermont	Twice annually	Continuously
Virginia	Semi-annually	Semi-annually
Washington	Twice annually	Twice annually
West Virginia	January and July	Twice annually and special meetings
Wisconsin	Twice annually	Twice annually
Wyoming	Three, annually	Three, annually
Alaska	January and Sept.	Twice annually
Canal Zone	On application	On application
Guam	On application	On application
Hawaii	January and July	Continuously
Puerto Rico	Twice annually	Quarterly
Virgin Islands	Twice annually	No reciprocity

TABLE 26.—*Temporary Permits, 1952*

State	Terms of Validity	Permits Granted	Limited Licenses Issued
Arizona	Emergency—next board meeting	38	..
Delaware	Four months, emergency—one year	2	3
Florida	Emergency—six months	12	..
Georgia	Next board meeting	0	..
Idaho	Not to exceed six months	38	..
Illinois	Temporary—postgraduate or nonresident training for non-citizens who do not expect to practice in state; limited—for practice in state hospital	11	81
Indiana	Six months, reciprocity applicants	77	..
Kansas	Next board meeting	56	..
Kentucky	Temporary in lieu of license by endorsement—six months—limited—one year—renewable—for institutional and public health work	42	14
Louisiana	Next board meeting	77	..
Maine	Temporary—one year residency; limited—camp physician—one season	9	28
Massachusetts	Interns and residents	..	(a)
Michigan	Residency training. Renewable for five years	220	..
Mississippi	Next board meeting	70	..
Nevada	One year for hospital practice	9	..
New Hampshire	Locum tenets, emergencies, etc., time varies	..	19
New Jersey	Two weeks to four months	5	..
New Mexico	Practice in state hospital until next board meeting; camp physician, not to exceed six months, and emergency	..	4
North Carolina	Residents and for practice in prescribed area in neighboring state	..	46
Oklahoma	Residents—three years	3	..
South Dakota	For displaced persons—4 years	..	12
Texas	Next board meeting	70	..
Virginia	Next board meeting	60	..
West Virginia	Next board meeting	(a)	..
Puerto Rico	Until 1955—Act 383 of 1946	25	..
Virgin Islands	Employees of government hospitals—next board meeting	1	..
Totals		825	207

(a) Figures not given.

list but do not specify whether they also accept graduates of other schools. Foreign-trained physicians are not eligible for licensure in nine states. Kentucky and Oklahoma, which heretofore did not license foreign-trained physicians, have indicated that they will now accept applications for licensure.

The present requirements for foreign-trained candidates seeking medical licensure in the United States and its territories and possessions are given in table 30. Forty-five boards will admit foreign physicians to the

TABLE 27.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$10	$ 50
Arizona	25	100
Arkansas	25	50 [1]
California	25	100
Colorado	25	50
Connecticut	25	50
Delaware	25	100
District of Columbia	25	50
Florida	50	..
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	50
Iowa	25	50
Kansas	25	50 [2]
Kentucky	25	75
Louisiana	25	50 [1]
Maine	25	50
Maryland	20	50
Massachusetts	25	50 [2]
Michigan	50	100
Minnesota	20	75
Mississippi	10	50
Missouri	25	100 [3]
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	30	50
New Jersey	25	100
New Mexico	50	50
New York	30	30
North Carolina	50	100
North Dakota	25	50 [1]
Ohio	25	50
Oklahoma	25	100
Oregon	25	100 [2]
Pennsylvania	25	50
Rhode Island	20	20
South Carolina	25	50
South Dakota	20	50
Tennessee	35	50
Texas	40	50
Utah	25	50
Vermont	20	50 [3]
Virginia	25	50
Washington	35	35
West Virginia	25	100
Wisconsin	45	75 [1]
Wyoming	25	50
Alaska	25	100
Guam	..	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	..

1. Minimum.
2. Endorsement of certificate of National Board of Medical Examiners $25.
3. National Board endorsement $20.

TABLE 28.—*States Requiring Annual Registration*

	Fee		Fee		Fee
Arizona	$ 5	Louisiana	$ 5	Tennessee	$ 5
Arkansas	a	Minnesota	2	Texas	2
California	2	Missouri*	5	Utah	3
Colorado	b	Montana	5	Vermont	2
Connecticut	2	Nebraska	2	Virginia	1
Delaware	10	Nevada	5	Washington	5
Dist. of Columbia	2	New Mexico	d	West Virginia*	2
Florida	1†	New York*	5	Wisconsin	3
Georgia	None	North Dakota	e	Wyoming	2.50
Idaho	10	Oklahoma	3	Alaska	10
Indiana	c	Oregon	10	Hawaii	2
Iowa	1	Pennsylvania	1	Virgin Islands	‡
Kansas	1	South Dakota	2		

* Biennial registration.
† Required by State Board of Health.
‡ Annual fee charged by Municipality.
a. Residents $2, Nonresidents $4.
b. Residents $2, Nonresidents $10.
c. Residents $5, Nonresidents $10.
d. Residents $2, Nonresidents $5.
e. Residents $5, Nonresidents $2.

licensing examination under varying conditions. The 16 boards that accept only the graduates of the schools on the accepted list of the Council are listed in column 6. Twenty-six boards require full citizenship, while 13 require only that the applicant file citizenship papers. Twenty-nine boards indicate the foreign-trained physician must serve an internship in an approved hospital in the United States. Eighteen boards have specific requirements for foreign-educated physicians, and 19 boards reported varying exemptions. Columns 7 and 8 of table 30 refer to the boards that have additional requirements and exemptions. The factual data pertaining to these regulations are included in the text immediately below the table.

This chart was developed by the Council on Medical Education and Hospitals of the American Medical Association in an effort to assist the foreign-trained physician seeking licensure in the United States. While an attempt has been made to present the situation as it exists, the table is intended to give only a summary of existing requirements. Persons interested in licensure should supplement these data by communicating with the licensing boards. Medical licensure in the United States is a "state right" and is entirely under the jurisdiction of the governments of the individual states. The power to license physicians is exercised through the medical licensing boards of each state. Official information concerning the accept-

(Continued on page 448)

TABLE 29.—*Foreign Medical Schools*

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This list is not final and will be supplemented as information is compiled for other schools.

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine or
Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit te Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Université de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

China

Peiping Union Medical College

This recommendation applies to all those graduates who were granted the degree of Doctor of Medicine from the date when the first degrees were conferred in 1924 until and including the class of 1943. The education of students in the last class, that of 1943, was interrupted by World War II; therefore, some students finally completed their studies as late as 1949. However, their diplomas were issued as of the class of 1943. Following the Communist conquest of China the name of this school was changed to the China Union Medical College. The recommendation does not apply to this school.

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Geneeskunde Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneva Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Mèdecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Department Des Innern, Département Féderal de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales), or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis uber die bestandene Fachprufung für Ärzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom uber die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (Certificat d'Études Médicales).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

United Kingdom

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London †
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welsh National School of Medicine, University of Wales, Cardiff

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who did not complete the work for the degree and who obtained their qualifications only through the examinations of the licensing corporations of the United Kingdom.

† Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

TABLE 30.—Status of Requirements for Medical Licensure for Foreign-Trained Physicians

	Written Examination Required	Admitted Also on Reciprocal Basis*	Citizenship	Basic Science Certificate	Internship in United States	Recognition Limited to Graduates of Schools Accepted by A.M.A. and A.A.M.C.**	Additional Requirements	Exemptions	Examination Fee, Dollars
Alabama	x	..	x	..	x	..	x	..	10
Arizona	x	..	1stP	x	x	..	..	x	25
Arkansas	Not accepted								
California	x	..	x	..	x	..	x	x	25
Colorado	x	..	x	x	x	..	x	x	25
Connecticut	x	x	1stP	x	..	..	..	..	25
Delaware	x	..	x	..	x	..	x	..	25
Dist. of Columbia	x	x	..	x	x	x	..	x	25
Florida	x	..	x	x	..	..	x	..	50
Georgia	x	x	x	..	..	x	..	..	20
Idaho	Not accepted								
Illinois	x	..	1stP	..	x	..	x	..	15
Indiana	x	..	..	..	..	..	x	..	25
Iowa	x	..	x	x	x	..	x	x	25
Kansas	x	..	x	..	x	..	..	x	25
Kentucky	x	..	x	..	x	..	x	..	25
Louisiana	Not accepted								
Maine	x	x	..	..	..	..	..	..	25
Maryland	x	..	1stP	..	x	..	..	x	20
Massachusetts	x	..	1stP	..	..	..	..	x	25
Michigan	x	..	x	x	x	..	x	..	50
Minnesota	x	..	1stP	x	..	..	x	..	20
Mississippi	x	..	x	..	..	x	..	..	10
Missouri	x	..	x	..	x	x	..	..	25
Montana	Not accepted								
Nebraska	x	..	x	x	..	..	..	..	25
Nevada	Not accepted								
New Hampshire	x	x	x	..	x	..	..	x	30
New Jersey	x	x	x	..	x	..	x	x	25
New Mexico	x	..	1stP	x	..	x	..	..	50
New York	x	x	1stP	..	..	..	..	x	30
North Carolina	x	..	..	..	..	x	..	x	50
North Dakota	x	..	x	..	x	..	..	x	25
Ohio	x	x	1stP	..	..	..	..	x	25
Oklahoma	x	..	x	x	x	x	..	..	25
Oregon	x	..	x	x	x	x	..	..	25
Pennsylvania	x	..	1stP	..	x	..	..	x	25
Rhode Island	x	..	1stP	x	x	..	x	x	20
South Carolina	Not accepted								
South Dakota	x	..	1stP	x	x	x	x	..	20
Tennessee	x	..	x	x	..	x	..	..	35
Texas	x	..	x	x	..	..	..	x	25
Utah	Not accepted								
Vermont	Not accepted								
Virginia	x	..	x	..	..	..	x	x	25
Washington	x	..	..	x	x	x	..	..	35
West Virginia	x	..	x	..	x	..	x	..	25
Wisconsin	x	x	1stP	x	x	x	..	..	45
Wyoming	Not accepted								
Alaska	x	x	x	x	x	x	..	..	25
Guam	x	x	x	..	x	x	..	..	50
Hawaii	x	..	x	..	x	x	..	x	25
Puerto Rico	x	x	x	..	x	..	x	..	30
Virgin Islands	x	..	..	..	x	x	x	..	65

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x Implies Yes. * Refer to chart "Reciprocity and Endorsement Policies" for further data.

** American Medical Association and Association of American Medical Colleges.

Additional Requirements

Alabama. Candidate is eligible if his credentials have been appraised by the National Board of Medical Examiners and approved.

California. Applicant must present documentary evidence, satisfactory to the board, of (a) completion in a medical school or schools of a resident course of professional instruction equivalent to that given in an American school, (b) is in possession of a medical diploma, (c) has been admitted or licensed to practice medicine in the country wherein is located the institution in which he completed his training, and (d) if not a citizen of the United States, the country in which he has been licensed will admit to practice citizens of the United States. Applicants must pass a written, clinical and oral examination.

Colorado. Completion of senior year in approved medical school in the United States. Credentials must be submitted in original form and accompanied by translation, and will be directly verified or documents should bear evidence of being visaed by the U. S. Consul.

Delaware. Residence for one year required. Completion of senior year in approved medical school in the United States.

Florida. Three year internship and/or residency training in approved hospitals required. Two years of this training may be an internship but at least one year must be a residency. Eighteen months or more service in the medical corps of the Armed Forces of the United States will be accepted as one year internship.

Illinois. Approved rotating internship in Illinois required. Limited license issued for practice in hospitals maintained by the state.

Indiana. Senior year in approved medical school in the United States.

Iowa. Internship or one year in medical school in the United States.

Kentucky. Applicant required to complete at least five years' training in the United States in a hospital or other institution approved by the board and to have successfully passed a regular examination conducted by the National Board of Medical Examiners.

Michigan. Completion of senior year in approved medical school in the United States or Canada; or M.S. or D.S. degree in basic science or clinical medicine from a graduate school affiliated with an approved medical school; or in lieu of above, certificate of a comprehensive examination in the basic sciences and clinical medicine by a joint screening board of examiners from the faculties of the medical schools of the University of Michigan and Wayne University.

Minnesota. Considered on an individual basis. Credentials must be submitted in original form and accompanied by translation, and will be directly verified or documents should bear evidence of being visaed by the United States Consul in the country wherein the school of graduation is or was located.

New Jersey. Must submit original certificate covering medical courses, original diploma and license to practice in the foreign country with translations made by the Lawyers' and Merchants' Translation Bureau, 11 Broadway, New York City.

Rhode Island. Must pursue postgraduate study or serve additional one year internship or residency. Applicant must be licensed to practice medicine in country in which school of graduation is located.

South Dakota. Required to practice in an emergency area for four years under a temporary license before permanent licensure.

Virginia. Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, or must have completed the course of study and passed examinations equivalent to those required for a diploma or license conferring such full right to practice.

West Virginia. Must be resident of the state for three years immediately preceding application and be recommended by local medical society.

Puerto Rico. Further training required at the discretion of the board.

Virgin Islands. Residence requirement of six months.

Exemptions

Arizona. Acceptance at the discretion of the licensing board. A graduate who has served in the Armed Forces of the United States and has an honorable discharge is eligible.

California. Does not apply to graduates of Canadian medical schools.

Colorado. Graduates after January 1, 1940 not accepted.

District of Columbia. Does not apply to graduates of Canadian medical schools. Foreign-trained physicians acceptable for reciprocal registration if similar privileges are accorded licentiates of District of Columbia by licensing agency or jurisdiction from which the applicant comes.

Iowa. Graduates of foreign medical schools are considered individually. Graduates of medical schools in Europe who obtained the medical degree after January 1, 1940 are not eligible unless they have graduated from one of the acceptable schools, or have done some special work in an approved medical school in the United States or a recognized hospital.

Kansas. Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, otherwise required to complete senior year in approved medical school in the United States. In lieu of internship, certificate from three graduates of the applicant's medical school licensed in the United States accepted.

Maryland. Graduates of medical schools on list of acceptable medical schools approved by the American Medical Association and the Association of American Medical Colleges are accepted after completion of one year of internship or residency in an approved hospital in the United States, and have presented at least two letters, recommending them as to their professional ability and moral character, from the hospital authorities.

Graduates of other European medical schools who obtained the medical degree after January 1, 1940 are not eligible.

Graduates before January 1, 1940, whose schools were known to have had acceptable standards at the time of graduation may be considered if their credentials and professional experience in the United States are of such quality and duration as to be acceptable to the board.

Graduates of Latin American schools not on the acceptable list referred to in the first paragraph above are not eligible.

Massachusetts. Graduates who matriculated prior to January 1, 1941 are eligible to apply for admission to the examinations. Graduates after January 1, 1941 must be graduates of a medical school approved by the Approving Authority for Colleges and Medical Schools of the Commonwealth of Massachusetts. The Approving Authority has not approved any foreign medical schools.

New Hampshire. Diplomates of National Board of Medical Examiners eligible on reciprocity basis. Temporary license valid until citizenship is completed may be given. Considered on an individual basis.

New Jersey. Internship completed in foreign countries after July 1, 1934 not acceptable. Graduates of medical schools of Europe and Asia prior to November 19, 1941 accepted. Graduates of medical schools of South American Republics, Mexico, Cuba not accepted. Acceptance of graduates after January 1, 1949 limited to schools recognized by the board.

New York. Graduates of foreign medical schools after October 1939 not acceptable. All such graduates are required to submit a petition to the Board of Regents and have them determine what additional requirements will be necessary in order to qualify for the examinations. List of approved foreign schools maintained by the Board of Regents.

North Carolina. Considered on an individual basis.

North Dakota. License to practice medicine and surgery in country in which school is located, otherwise required to complete senior year in approved medical school in the United States. Graduates of medical schools of Continental Europe prior to 1939 not eligible. Graduates of Canadian, British, Scotch and Irish medical schools accepted.

Ohio. Graduates of medical schools of Continental Europe after 1943 not accepted unless from school on acceptable list. Applicant must hold a diploma or license in a foreign country.

Pennsylvania. Graduates after 1941 not eligible.

Rhode Island. Matriculants in foreign medical faculties subsequent to January 1, 1949 not acceptable.

Texas. After 1939 limited to English speaking schools.

Virginia. Citizenship requirement may be waived by the board at its discretion upon receiving satisfactory reason why candidate has not become a citizen.

Hawaii. Diplomates of National Board of Medical Examiners eligible on reciprocity basis.

TABLE 31.—FOREIGN-TRAINED PHYSICIANS EXAMINED

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 California P	F	4 Colorado P	F	5 Connecticut P	F	6 Delaware P	F	7 Dist. of Columbia P	F	8 Florida P	F	9 Georgia P	F	10 Illinois P	F	11 Indiana P	F	12 Iowa P	F	13 Kansas P	F	14 Maine P	F
	ARGENTINA																												
1	Universidad Nacional de Buenos Aires	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	0	1	..	..	..	..	..	..	..	..
	AUSTRALIA																												
2	University of Melbourne	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	University of Queensland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	AUSTRIA																												
4	Karl-Franzens-Universität, Graz	..	..	..	..	0	1	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
5	Leopold Franzens-Universität, Innsbruck	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	6	3	..	..	..	..	..	..	..	..
6	Universität Wien	..	..	..	..	7	2	..	..	1	2	..	..	..	..	1	0	1	0	2	2	..	..	..	..	..	..	..	..
	BELGIUM																												
7	Université Bruxelles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
8	Universiteit Gent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	Université de Liège	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BRAZIL																												
10	Universidade do Rio de Janeiro	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	Universidade de São Paulo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	BULGARIA																												
12	University of Sofia	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHILE																												
13	Universidad de Chile, Santiago	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHINA																												
14	University of Hongkong	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
15	East China Union Medical College, Nanking	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Peiping Union Medical College	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
17	Pennsylvania Medical School, Shanghai	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Cheeloo University, Shantung	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	Hackett Medical College for Women, Canton	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	West China Union University, Szechwan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	Aurora University, Shanghai	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	Tung Nan Medical College, Shanghai	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLOMBIA																												
23	Universidad Nacional, Bogota	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
	CUBA																												
24	Universidad de la Habana	..	..	..	..	0	1	..	..	..	..	..	..	..	..	2	0	..	..	16	17	..	..	..	..	..	..	..	..
	CZECHOSLOVAKIA																												
25	Deutsche Universität, Prag	..	..	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	0	1
26	Universita Karlova, Praha	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	0	5	..	..	..	..	..	..	..	..
27	Univerzita Komenského, Bratislava	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
28	Masarykova Universita, Brno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	DENMARK																												
29	Københavns Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DOMINICAN REPUBLIC																												
30	Universidad de Santo Domingo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ECUADOR																												
31	Universidad Central, Quito	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	EGYPT																												
32	Fouad First University, Cairo	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	EL SALVADOR																												
33	Universidad de El Salvador, San Salvador	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ENGLAND																												
34	University of Cambridge	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
35	University of Durham, Newcastle-upon-Tyne	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
36	University of Liverpool	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
37	University of London	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	1	0
38	University of Manchester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
39	University of Oxford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
40	Licentiate Royal College of Physicians of London and Member Royal College of Surgeons of England	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	1	1	..	..	..	..	..	..	..	..
41	Licentiate Apothocaries' Society of London	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ESTONIA																												
42	Tartu Ülikooli	..	..	..	..	0	1	..	..	..	..	..	..	1	0	..	..	..	..	1	1	..	..	..	..	..	..	..	..
	FINLAND																												
43	Helsingfors Universitet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	FRANCE																												
44	Université de Lyon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
45	Université de Montpelier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
46	Université de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
47	Université de Paris	..	..	..	..	1	1	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	1
48	Université de Toulouse	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	GERMANY																												
49	Friedrich-Wilhelms-Universität, Berlin	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	1	2	..	..	..	..	..	..	..	..
50	Rheinische Friedrich-Wilhelms-Universität, Bonn	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
51	Schlesische-Friedrich-Wilhelms-Universität, Breslau	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
52	Friedrich-Alexanders-Universität, Erlangen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	14	..	..	..	..	..	..	..	..
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14	

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Tennessee	Texas	Virginia	Washington	West Virginia	Wisconsin	U. S. Possessions	Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					Marginal Number
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1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 6	.. ..	.. ..	1 2	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	19	8	11	57.9	8 4
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	13	8	5	38.4	5 5
1 0	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	16 18	.. ..	2 0	1 2	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	62	36	26	41.9	12 6
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	3 7
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.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1 13
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1 2	.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	6 6	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	25	11	14	56.0	7 26
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.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	2	1	1	50.0	2 30
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.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1 35
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1 36
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1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	11	10	1	9.1	7 40
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.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	4 4	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	13	6	7	53.8	5 42
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1 43
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1 44
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1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 4	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	13	6	7	53.8	7 47
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1 0	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7 16	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	32	12	20	62.5	8 49
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2 50
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	3	3	50.0	3 51
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	28	13	15	53.6	3 52
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42

Marginal Number	SCHOOL	Alabama P	Alabama F	Arizona P	Arizona F	California P	California F	Colorado P	Colorado F	Connecticut P	Connecticut F	Delaware P	Delaware F	Dist. of Columbia P	Dist. of Columbia F	Florida P	Florida F	Georgia P	Georgia F	Illinois P	Illinois F	Indiana P	Indiana F	Iowa P	Iowa F	Kansas P	Kansas F	Maine P	Maine F
	GERMANY—Continued																												
53	Albert-Ludwigs-Universität, Freiburg	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
54	Georg August-Universität, Gottingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
55	Ernst-Moritz-Arndt Universität, Greifswald	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
56	Universität Heidelberg	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	6	3	..	..	..	..	..	..	..	..
57	Thüringische Landesuniversität, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	Christian-Albrechts-Universität, Kiel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
59	Albertus-Universität, Konigsberg	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
60	Universität Leipzig	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
61	Philipps-Universität, Marburg	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..
62	Ludwig-Maximilians-Universität, Munchen	..	..	..	..	7	2	..	..	..	..	..	..	..	..	..	..	..	..	17	11	..	..	..	..	..	..	..	..
63	Universität Rostock	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	Eberhard-Karls-Universität, Tubingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	6	..	..	..	..	..	..	..	..
65	Julius-Maximilians-Universität, Würzburg	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
66	Hamburgische Universität, Hamburg	..	..	..	..	1	2	..	..	0	1	..	..	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..
67	Universität Köln	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
68	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	..	..	..	..	2	2	..	..	0	1	..	..	..	..	..	..	..	..	3	2	..	..	..	..	..	..	1	0
69	Westfalische Wilhelms-Universität, Munster	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
70	Medizinische Akademie Düsseldorf	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..
71	United Hungarian University, Halle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	GREECE																												
72	National University of Athens	..	..	..	..	2	1	..	..	..	..	..	..	..	..	1	0	..	..	2	3	..	..	..	..	..	..	..	..
	HAITI																												
73	École Nationale, Port-au-Prince	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..
	HONDURAS																												
74	Universidad Central de la República de Honduras, Tegucigalpa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	HUNGARY																												
75	Magyar Királyi Pázmány Petrus Tudományegyetum, Budapest	..	..	..	..	2	2	..	..	1	2	..	..	..	..	..	..	..	..	3	7	..	..	..	..	..	..	..	..
76	Magyar Királyi Ferencz Józef Tudományegyetum, Szeged	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
77	Magyar Királyi Erzébet Tudományegyetem, Pécs	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	Magyar Királyi Tisze-István Tudományegyetum, Debrecen	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	IRAQ																												
79	Royal Iraq Medical College, Bagdad	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRELAND																												
80	Queen's University, Belfast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81	National University of Ireland	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..
82	University of Dublin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ITALY																												
83	Regia Università di Bologna	..	..	..	..	0	1	..	..	0	1	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..
84	Regia Università di Milano	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
85	Regia Università di Catania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	Regia Università di Firenze	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
87	Regia Università di Genova	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
88	Regia Università di Messina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	Regia Università di Modena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	Regia Università di Napoli	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
91	Regia Università di Padova	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
92	Regia Università di Palermo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
93	Regia Università di Parma	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
94	Regia Università di Pavia	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
95	Regia Università di Perugia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
96	Regia Università di Pisa	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
97	Regia Università di Roma	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..
98	Regia Università di Sassari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
99	Regia Università di Torino	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
100	Regia Università di Bari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	JAPAN																												
101	Tokyo Charity Association Medical College	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
102	Keio Gijiku University, Tokyo	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LATVIA																												
103	Latvijas Universitäte, Riga	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..
	LEBANON																												
104	American University of Beirut	..	..	..	..	1	0	..	..	1	0	1	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..
105	Faculté Française de l'Université de St. Joseph, Beyrouth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LITHUANIA																												
106	Vytauto Didziojo Universiteto, Kaunas	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	11	21	..	..	..	..	..	..	..	..
	MEXICO																												
107	Universidad Nacional, Mexico City	..	..	..	..	6	5	..	..	..	..	..	..	..	..	..	..	1	0	3	1	..	..	..	..	..	..	..	..
108	Escuela de Nuevo Leon, Monterrey	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..
109	Universidad de Guadalajara	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
110	Escuelo Médico Militar, Mexico City	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
111	Universidad Libre Mexicana, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
112	National Autonomous University of Mexico, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NETHERLANDS																												
113	Universiteit van Amsterdam	..	..	..	..	1	0	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0
114	Rijks-Universiteit te Groningen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
115	Rijks-Universiteit te Leiden	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
116	Rijks-Universiteit te Utrecht	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14														

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Tennessee	Texas	Virginia	Washington	West Virginia	Wisconsin	U. S. Possessions	Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
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.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	4	1	20.0	2	54
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	1	55
1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	3 2	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	18	13	5	27.8	6	56
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	1	57
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	3	1	25.0	3	58
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	59
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	60
0 1	.. ..	1 1	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	4 5	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	54	34	20	37.0	8	62
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	63
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	20	13	7	35.0	4	64
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	65
.. ..	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	4 4	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	22	9	13	59.1	8	66
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	67
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	16	8	8	50.0	6	68
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	2	69
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	1	5	83.3	2	70
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	71
.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 8	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	. ..	.. ..	.. ..	.. ..	.. ..	21	7	14	66.7	6	72
.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	3	2	40.0	2	73
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	74
3 1	1 1	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 18	.. ..	.. ..	6 3	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	.. ..	56	20	36	64.3	9	75
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 1	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	6	2	25.0	4	76
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 3	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9	5	4	44.4	3	77
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 3	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	11	6	5	45.5	4	78
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	79
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	80
4 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	15	13	2	13.3	5	81
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	82
.. ..	0 1	.. ..	.. ..	.. ..	1 0	.. ..	0 3	.. ..	6 14	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	29	7	22	75.9	7	83
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	2	84
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	85
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	86
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	4	1	20.0	3	87
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	88
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	1	89
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	0 3	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	2	6	75.0	5	90
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	1	91
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	0	5	100.0	3	92
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	2	93
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	94
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	95
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	2	4	66.7	3	96
.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	2 7	.. ..	.. ..	.. ..	.. ..	4 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	23	13	10	43.5	7	97
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	98
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	1	2	66.7	2	99
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	100
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	101
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	102
1 1	.. ..	2 0	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	3 8	.. ..	2 0	3 2	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	29	16	13	44.8	9	103
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 0	.. ..	.. ..	.. ..	11	10	1	9.1	9	104
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	1	105
3 3	0 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6 13	.. ..	.. ..	3 4	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	69	26	43	62.3	8	106
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	21	13	8	38.1	6	107
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	6	6	0	0.0	4	108
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	109
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	110
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	1	0	1	100.0	1	111
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	2	2	0	0.0	1	112
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	6	5	1	16.7	4	113
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	114
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 0	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	1 0	6	5	1	16.7	5	115
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	5	4	1	20.0	4	116
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	

TABLE 31.—FOREIGN-TRAINED PHYSICIANS EXAMINED

Marginal Number	SCHOOL	1 Alabama		2 Arizona		3 California		4 Colorado		5 Connecticut		6 Delaware		7 Dist. of Columbia		8 Florida		9 Georgia		10 Illinois		11 Indiana		12 Iowa		13 Kansas		14 Maine	
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
	NORWAY																												
117	Kongelige Frederiks Universitet, Oslo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PERU																												
118	Universidad Mayor de San Marcos de Lima	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	PHILIPPINES																												
119	University of Santo Tomas, Manila	..	..	..	..	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..
120	University of the Philippines, Manila	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	POLAND																												
121	Uniwersytet Jagielloński Wydzial Lekarski, Cracow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
122	Uniwersytet Jana Kazimierza Wydzial Lekarski, Lwow (Lemberg)	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..
123	Uniwersytet Jozefa Pilsudskiégo, Warsaw	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..
124	Uniwersytet Poznański Wydzial Lekarski, Poznan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
125	Uniwersytet Stefana Batorego Wydzial Lekarski, Wilno	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
126	Medical Academy of Danzig	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	PORTUGAL																												
127	Universidade de Coimbra	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
128	Universidade de Lisboa	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
129	Universidade do Porto	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	RUMANIA																												
130	Universitatea din Bucuresti	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
131	Universitatea din Iasi	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
132	Universitatea Regele Ferdinand I-iu din Cluj	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	SCOTLAND																												
133	University of St. Andrew's, St. Andrews and Dundee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..
134	University of Edinburgh	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
135	University of Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..
136	Anderson College of Medicine, Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
137	Licentiate of the Royal College of Physicians and Surgeons of Edinburgh, and Licentiate of the Royal Faculty of Physicians and Surgeons of Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
138	Polish School of Medicine, Edinburgh	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SOUTH AFRICA																												
139	University of Witwatersrand, Johannesburg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
140	University of Cape Town	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SPAIN																												
141	Universidad Central de España, Madrid	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
142	Universidad de Salamanca	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWEDEN																												
143	Kungl Karolinska Universitetet, Lund	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWITZERLAND																												
144	Universität Basel	..	..	..	..	1	0	..	..	1	2	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..
145	Universität Bern	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
146	Université de Gèneve	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
147	Université de Lausanne	..	..	..	..	2	0	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..
148	Universität Zurich	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	TURKEY																												
149	University of Istanbul	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	UNION OF SOCIALIST SOVIET REPUBLICS																												
150	Kazan Medical Institute	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
151	Kharkov Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
152	Kiev Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
153	First Moscow Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
154	Odessa Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
155	Tomsk Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
156	Dnepropetrovsk Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
157	Severo-Kavka Medical Institute, Rostov-on-the-Don	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
158	Military Medical Academy, Leningrad	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
159	University Baku	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	VENEZUELA																												
160	Universidad Central de Venezuela, Caracas	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	WALES																												
161	University of Wales, Cardiff	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	YUGOSLAVIA																												
162	Zagrebaskog Universiteta, Zagreb	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
163	Beogradskog Universiteta, Beograd	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..
	Totals	2	1			143		1		21		2		2		17		2		313		1		3		1		6	
	Totals—Examined—Passed	2	1			98		1		7		2		2		14		2		153		0		3		1		4	
	Totals—Examined—Failed	0	0			45		0		14		0		0		3		0		160		1		0		0		2	
	Percentage Failed	0.0	0.0			31.4		0.0		66.7		0.0		0.0		17.7		0.0		51.1		100.0		0.0		0.0		33.3	
	Marginal Number	1	2			3		4		5		6		7		8		9		10		11		12		13		14	

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Tennessee	Texas	Virginia	Washington	West Virginia	Wisconsin	U. S. Possessions	Totals	Examined—Passed	Examined—Failed	Percentage Failed	Number of Boards Examined by Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
.. .. 2 0 .. .. 1 1 .. .. 1 0																							5	4	1	20.0	3 117
.. .. 1 0 .. .. 1 0																							4	4	0	0.0	4 118
.. .. 1 0																							7	6	1	14.3	3 119
.. .. 1 0																							3	3	0	0.0	2 120
0 1 .. .. 1 0 .. .. 5 2 .. .. 3 0																							15	11	4	26.7	5 121
.. .. 1 0 .. .. 9 14 .. .. 1 0 3 3																							36	16	20	55.6	6 122
1 1 .. .. 1 0 .. .. 5 3 .. .. 0 1																							13	7	6	46.2	4 123
.. .. 0 2 .. .. 1 1																							10	5	5	50.0	5 124
.. .. 2 1 .. .. 1 0																							7	5	2	28.6	4 125
.. ..																							1	0	1	100.0	1 126
.. ..																							2	2	0	0.0	1 127
.. ..																							3	2	1	33.3	2 128
.. ..																							1	0	1	100.0	1 129
.. .. 1 2																							4	1	3	75.0	2 130
.. .. 1 0 .. .. 1 2 .. .. 1 0																							2	0	2	100.0	2 131
.. ..																							7	4	3	42.9	5 132
.. ..																											
.. .. 1 0 .. .. 1 0 1 0																							3	2	1	33.3	1 133
.. .. 3 0 1 0																							6	6	0	0.0	5 134
.. ..																							6	6	0	0.0	4 135
.. ..																							1	1	0	0.0	1 136
.. .. 1 0 .. .. 0 1 .. .. 1 0 .. .. 1 0																							4	3	1	25.0	4 137
.. ..																							2	1	1	50.0	1 138
1 0																											
1 0 .. .. 1 0																							1	1	0	0.0	1 139
.. ..																							2	2	0	0.0	2 140
.. ..																											
.. ..																							2	0	2	100.0	2 141
.. ..																							2	1	1	50.0	1 142
.. .. 0 1																											
.. ..																							1	0	1	100.0	1 143
1 0 .. .. 2 0 .. .. 1 0 .. .. 1 0																											
.. .. 2 2																							13	10	3	23.1	7 144
1 0 0 1 .. .. 3 2																							5	3	2	40.0	2 145
.. .. 0 2 .. .. 0 1 .. .. 3 4																							12	7	5	41.7	5 146
.. .. 1 0 .. .. 3 1																							16	9	7	43.8	7 147
.. ..																							6	5	1	16.7	3 148
.. .. 1 1																							3	2	1	33.3	2 149
.. .. 0 1																							2	1	1	50.0	2 150
1 0 .. .. 1 2																							1	0	1	100.0	1 151
.. .. 1 4 .. .. .. 1 1																							4	2	2	50.0	2 152
.. .. 0 1																							8	2	6	75.0	3 153
.. .. 0 1																							1	0	1	100.0	1 154
.. ..																							1	0	1	100.0	1 155
.. .. 1 1																							1	1	0	0.0	1 156
.. ..																							3	1	2	66.7	2 157
.. .. 0 1																							1	1	0	0.0	1 158
.. ..																							1	0	1	100.0	1 159
.. ..																							1	1	0	0.0	1 160
.. .. 1 0																							1	1	0	0.0	1 161
1 1 .. .. 0 2																							9	5	4	44.4	4 162
.. .. 2 2 .. .. 1 0																							10	4	6	60.0	3 163
42	27	12	10	1	5	3	9	1	427	4	7	59	8	24	5	1	9	13	4	1	3	18	1,208	...	...	...	...
31	10	10	10	1	5	2	3	1	171	4	6	34	6	23	5	1	6	8	4	1	3	13	...	648	...	....	...
11	17	2	0	0	0	1	6	0	256	0	1	25	2	1	0	0	3	5	0	0	0	5	...	...	560	....	...
26.2	63.0	16.7	0.0	0.0	0.0	33.3	66.7	0.0	59.9	0.0	14.3	42.4	25.0	4.2	0.0	0.0	33.3	38.4	0.0	0.0	0.0	27.8	...	...	...	46.3	...
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42

ability of foreign credentials should be obtained directly from the licensing boards.

Table 31 records the number of graduates of foreign faculties of medicine examined for medical licensure by 37 boards in 1952. The figures include both American and foreign born physicians. Graduates of 160 medical schools and 3 licensing corporations were examined. Graduates of medical schools in the Philippines, 15 South and Central American countries, 28 countries in Europe, and 6 in Asia were represented at examinations. The number examined totaled 1,208. The number who were successful was 648; failures numbered 560, or 46.3%. There were more than 30 graduates of eight schools examined during the year. Graduates of the University of Kaunas, Lithuania, represented the largest group from any one school; 69 graduates of this school were examined in eight states, of whom 26 passed and 43, or 62.3%, failed. From Central America the school represented by the largest group was the University of Havana; 52 graduates of this school were examined in eight states, with 50% failures.

TABLE 32.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada—1930-1952*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
1951	1,006	524	47.9
1952	1,208	648	46.3
Totals	18,909	9,708	48.6

The greatest number examined in any one state was 427 in New York, of whom 171 passed and 256, or 59.9%, failed. Illinois examined 313, of whom 153 passed and 160, or 51.1%, failed. There were 143 examined in California, 98 passed and 45, or 31.4%, failed. Other states examined fewer than 60.

Table 32 presents the number of graduates of foreign faculties of medicine examined for medical licensure in the United States in 23 years (1930-1952). In 1936 the number of foreign-trained physicians began to increase, and by 1940 over three times as many were tested as in 1936. Beginning in 1944, the numbers examined began to decrease until 1951, when there was a noticeable increase. Again in 1952 there was an increase. At no time in the 23 year period did fewer than 30.7% fail in a given year.

Represented in table 33 are figures regarding foreign-trained physicians who were not previously licensed in the United States and therefore are additions to the medical profession. There were 569 in this group, 545 of whom were licensed by written examination and 41 by endorsement of credentials. Similar figures have been recorded for two previous years and together with the figures for 1952 are given in table 34. In this three year period 1,531 foreign-trained physicians were licensed to practice medicine in the United States and 1,327 represent additions to the physician population. The yearly increase as shown in this table is evidence of the efforts of those administering medical licensure to give every consideration to the qualified foreign-trained physician and at the same time uphold the high standards of medical licensure in the United States.

TABLE 33.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1952*

	Examination	Reciprocity and Endorsement	Total
Alabama	2	0	2
California	70	0	70
Connecticut	5	1	6
Delaware	2	0	2
District of Columbia	2	2	4
Florida	2	0	2
Georgia	1	0	1
Illinois	146	0	146
Indiana	0	1	1
Iowa	2	0	2
Maine	4	0	4
Maryland	31	0	31
Massachusetts	9	1	10
Minnesota	9	0	9
Mississippi	1	0	1
Missouri	5	0	5
New Hampshire	2	0	2
New Jersey	3	0	3
New Mexico	1	0	1
New York	161	17	178
North Carolina	4	0	4
North Dakota	5	0	5
Ohio	35	0	35
Pennsylvania	3	0	3
Rhode Island	17	0	17
Texas	4	0	4
Virginia	0	1	1
Washington	3	1	4
Wisconsin	3	0	3
Hawaii	2	0	2
Puerto Rico	6	0	6
Guam	5	0	5
Totals	545	24	569

TABLE 34.—*Additions to the Medical Profession Representing Graduates of Foreign Medical Faculties, 1950-1952*

	Examination	Reciprocity and Endorsement	Totals
1950	267	41	308
1951	425	25	450
1952	545	24	569
Totals	1,237	90	1,327

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BOARDS OF EXAMINERS IN THE BASIC SCIENCES

A basic science certificate is a prerequisite for medical licensure in 19 states, the District of Columbia, and Alaska. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before that board and demonstrate his knowledge of the basic sciences. A certificate of proficiency in the basic sciences does not authorize the possessor to practice the healing art; it enables him only to apply for licensure. The states comprizing this group, together with the year of enactment of the basic science law, are recorded in table 35. No new basic science law was enacted in 1952.

TABLE 35.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nevada	1951
Arizona	1936	New Mexico	1941
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1934
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1949
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925
Nebraska	1927		

TABLE 36.—*Subjects Included in Basic Science Examinations*

	Examination Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	x	x	x	..	x	x	x	..
Arizona	x	x	x	..	x	x	x	..
Arkansas	x	x	x	..	x	x	x	..
Colorado	x	x	x	..	..	x	x	..
Connecticut	x	..	..	x	x	x	x	..
District of Columbia	x	x	x	..	..	x	x	..
Florida	x	x	x	..	..	x	x	..
Iowa	x	x	x	..	x	x	x	..
Michigan	x	x	x	..	..	x	x	..
Minnesota	x	x	x	..	x	x	x	..
Nebraska	x	x	x	..	x	x	x	..
Nevada	x	x	x	..	..	x	x	..
New Mexico	x	x	x	..	..	x	x	..
Oklahoma	x	x	x	..	..	x	x	..
Oregon	x	..	x	..	x	x	x	..
Rhode Island	x	x	x	..	..	x	x	..
South Dakota	x	x	x	..	..	x	x	..
Tennessee	x	x	x	..	..	x	x	..
Texas	x	x	x	..	x	x	x	x
Washington	x	..	x	..	x	x	x	..
Wisconsin	x	..	..	x	..	x	x	..

TABLE 37.—*Reciprocity, Endorsement, Waiver, or Exemption Policies of Basic Science Boards*

	Credentials Accepted
Alaska	Physicians are accepted on reciprocity from the following state medical and/or basic science boards: Alabama, Arkansas, California, Colorado Connecticut, District of Columbia, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin.
Arizona	Any basic science certificate that has been obtained by an examination before the issuing board to the extent that the examination has covered the same topics Arizona examines in and provided at least four subjects were passed at once. Practitioners licensed in a basic science state prior to the passage of basic science legislation are eligible on a previous licensure basis.
Arkansas	Variable.
Colorado	(a) As of July 1, 1951 there is complete reciprocity with the following basic science boards: Arizona, Arkansas, District of Columbia, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Rhode Island, South Dakota, Tennessee and Texas. (b) Applicants who present basic science certificates from the Connecticut and Wisconsin boards are examined in chemistry and bacteriology. (c) Complete reciprocity with the Iowa Basic Science Board is granted to those candidates whose original application was received on or before June 1, 1949. Others must pass four of the five subjects given by the Colorado Board. (d) Reciprocity is granted with Alaska to those candidates who have passed, at one sitting, four out of the five subjects given by the Colorado Board.
Connecticut	No reciprocity. Board may in its discretion waive examination.
District of Columbia	Board may exempt an applicant. All requests are considered individually.
Florida	None.
Iowa	Certificate by exemption granted if credentials presented are equal to those of Iowa Basic Science Board.
Michigan	Certificates from Arkansas, Minnesota and Nebraska basic science boards.
Minnesota	Reciprocity on an automatic basis with the basic science boards of Arkansas, Colorado, Nebraska, Oregon and Tennessee and Part I of the National Board of Medical Examiners. Reciprocity on an individual basis with basic science boards of Arizona, Nevada, New Mexico, Oklahoma, South Dakota and Texas. Reciprocity on an individual basis with the medical licensing boards of Alaska, Indiana, Kentucky, New York (subsequent to 1925), Oklahoma, Texas, Vermont and Virginia. Credit granted for grades in certain subjects passed in examinations of medical licensing boards of Alabama, Georgia, Louisiana, New York (subsequent to 1925), North Carolina and the District of Columbia, and the basic science board in Wisconsin.
Nebraska	In the case of states having a basic science law, waiver is based on the results of the basic science examination. Waiver may be made on the basis of grades obtained before a medical board, if basic science certificate is not held by applicant. A grade of at least 75 per cent is necessary in each of the basic science subjects in which applicants are examined in Nebraska.
Nevada	Certificate of Arizona, Colorado, Minnesota, Oklahoma, South Dakota and Tennessee. Waiver with other basic science boards to the extent that their requirements correspond with those of Nevada.
New Mexico	Reciprocity with basic science boards of Arizona, Colorado, Iowa, Michigan, Minnesota, Oklahoma, Oregon and Tennessee and limited reciprocity with Wisconsin.
Oklahoma	No signed agreements. Applicants are accepted or rejected on the basis of individual qualifications.
Oregon	Certificate in the basic sciences obtained by examination in Arkansas, Colorado, Iowa, Minnesota, Nebraska, New Mexico, Oklahoma, South Dakota, Tennessee, Texas and Wisconsin.
Rhode Island	Endorsement with Massachusetts Board of Registration in Medicine and basic science board of Oklahoma.
South Dakota	Certificate of basic science boards of Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, Tennessee, Texas and Wisconsin.
Tennessee	(a) Certificate of basic science boards of Arizona, Arkansas, Colorado, District of Columbia, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, South Dakota, Texas, Virginia and Wisconsin. (b) Granting of a certificate by waiver by accepting grades in required subjects earned by examination before a medical examining board or the National Board of Medical Examiners is handled on an individual basis.
Texas	Certificate of basic science boards of Alaska, Arizona, Arkansas, Colorado, Iowa, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, South Dakota and Tennessee and partial reciprocity with Wisconsin. Waiver of examination upon submission of transcript of preprofessional and professional school credits under certain conditions.
Washington	None.
Wisconsin	Accepts certification on the basis of examination from any legally established board. Accepts service in the Medical Corps of the Armed Forces. Accepts certification by the Medical Council of Canada.

TABLE 38.—*Applicants Examined in Basic Sciences, 1952*

	Physicians, Dentists and Medical Students		Osteopaths		Chiropractors and Naturopaths		Unclassified and Others		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Alaska	3	0	0	0	0	0	0	0	3	3	0	0.0
Arizona	63	..	14	..	3	..	25	22*	127	105	22	17.3
Arkansas	77	18	30	17	5	7	28	24	206	140	66	32.0
Colorado	155	0	5	0	0	0	28	0	188	188	0	0.0
Connecticut	128	9	3	0	11	14	0	0	165	142	23	13.9
District of Columbia	11	0	0	0	0	0	0	0	11	11	0	0.0
Florida	464	154	21	14	5	3	174	171	1,006	664	342	33.0
Iowa	158	..	67	..	28	..	182	..	435	435	**	0.0
Michigan	426	38	12	7	0	5	52	61	601	490	111	18.4
Minnesota	252	..	38	..	2	..	93	410*	795	385	410	51.6
Nebraska	75	13	1	0	0	0	1	2	92	77	15	16.3
Nevada	13	3	0	0	0	0	1	4	21	14	7	33.3
New Mexico	33	0	5	0	0	0	9	0	47	47	0	0.0
Oklahoma	62	9	0	1	1	0	5	7	85	68	17	20.0
Oregon	100	51	4	0	0	1	4	54	214	108	106	49.5
Rhode Island	103	15	3	0	2	3	0	0	126	108	18	14.3
South Dakota	35	5	17	0	0	0	29	22	108	81	27	25.0
Tennessee	221	33	0	0	0	0	4	1	259	225	34	13.1
Texas	97	18	1	0	0	3	0	0	119	98	21	17.6
Washington	193	17	5	2	4	16	0	5	242	202	40	16.5
Wisconsin	201	10	7	2	7	75	0	0	302	215	87	28.8
Totals—Examined	3,263		276		195		1,418		5,152			
Totals—Passed	2,870		233		68		635			3,806		
Totals—Failed	393		43		127		783				1,346	
Percentage—Failed	12.0		15.5		65.1		55.2					26.1

* Nature of practice undeterminable since names of failures not supplied.
** Failures not reported.

TABLE 39.—*Basic Science Certificates Issued by Examination, Reciprocity, and Endorsement, 1952*

	Examination					Reciprocity, Endorsement, Exemption or Waiver					
	Physicians, Dentists and Medical Students	Osteopaths	Chiropractors and Naturopaths	Unclassified and Others	Totals	Physicians, Dentists and Medical Students	Osteopaths	Chiropractors and Others	Unclassified	Totals	Registered
Alaska	3	0	0	0	3	14	0	1	1	16	19
Arizona	63	14	3	25	105	27	6	1	13	47	152
Arkansas	77	30	5	28	140	64	0	3	0	67	207
Colorado	155	5	0	28	188	34	18	2	23	77	265
Connecticut	128	3	11	0	142	0	0	0	0	0	142
Dist. of Columbia	11	0	0	0	11	134	0	0	0	134	145
Florida	464	21	5	174	664	0	0	0	0	0	664
Iowa	158	67	28	182	435	122	10	0	19	151	586
Michigan	426	12	0	52	490	7	49	4	50	110	600
Minnesota	252	38	2	93	385	133	0	0	8	141	526
Nebraska	75	1	0	1	77	32	0	0	1	33	110
Nevada	13	0	0	1	14	17	0	0	1	18	32
New Mexico	33	5	0	9	47	0	0	0	0	0	47
Oklahoma	62	0	1	5	68	1	0	0	0	1	69
Oregon	100	4	0	4	108	46	13	2	39	100	208
Rhode Island	103	3	2	0	108	0	0	0	0	0	108
South Dakota	35	17	0	29	81	17	0	0	13	30	111
Tennessee	221	0	0	4	225	93	6	1	9	109	334
Texas	97	1	0	0	98	574	77	1	36	688	786
Washington	193	5	4	0	202	0	0	0	0	0	202
Wisconsin	201	7	7	0	215	156	11	35	0	202	417
Totals	2,870	233	68	635	3,806	1,471	190	50	213	1,924	5,730

The subjects in which examinations are given are specified in the law. Table 36 lists the states and the subjects in which examination is required. These subjects are not uniform, although all boards examine in anatomy, pathology, and physiology, 19 examine in chemistry, 17 in bacteriology, 10 in hygiene, 2 in diagnosis, and 1 in public health. The laws in some states provide for certification without examination by exemption, waiver, reciprocity, or endorsement. The credentials acceptable for certification by one of these methods are outlined in table 37.

The results of examinations given and the number of certificates issued on the basis of waiver, exemption, reciprocity, or endorsement as reported by the basic science boards are shown in tables 38 and 39. The laws do not specify that a candidate must reveal his school of practice. The lists submitted by the respective boards, however, have been checked with the biographic records of physicians and medical students maintained by the American Medical Association and with various directories. In this way it has been possible to determine the profession of the majority of candidates. By this means the data presented have been tabulated in four groups, namely, physicians, dentists and medical students; osteopaths; chiropractors and naturopaths; and unclassified applicants. The latter category includes those for whom it was not possible to determine the profession represented. It is probable that many in this unclassified group include osteopaths, chiropractors, and naturopaths who have not been identified by the reference data available.

TABLE 40.—*Total Candidates for Basic Science Certification, 1927-1952*

		Physicians, Dentists and Medical Students						Other Practitioners					
	No. of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	305	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	680	586	94	13.8	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	106	696	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	121	648	60	30	30	50.0	10	40
1934	9	815	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,032	891	141	13.7	230	1,121	66	26	40	60.6	13	39
1937	12	1,231	1,061	170	13.8	192	1,253	113	41	72	63.7	10	51
1938	12	1,168	1,026	142	12.2	267	1,293	158	70	88	55.7	26	96
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
1940	16	1,303	1,140	163	12.5	324	1,464	280	153	127	43.9	22	175
1941	17	1,768	1,560	208	11.8	280	1,840	356	191	165	46.3	73	264
1942	17	1,725	1,476	249	14.4	213	1,689	497	249	248	49.9	91	340
1943	18	2,330	2,098	232	10.0	296	2,394	389	211	178	45.8	86	297
1944	18	2,284	1,868	416	18.2	222	2,090	465	276	189	40.6	87	363
1945	18	2,576	2,146	430	16.6	412	2,558	397	193	204	51.4	172	365
1946	19	2,937	2,391	546	18.7	1,308	3,699	313	167	146	46.6	166	333
1947	19	3,132	2,405	727	23.2	771	3,176	406	228	178	43.8	189	417
1948	19	3,000	2,601	399	13.3	1,069	3,670	827	437	390	47.1	349	786
1949	20	2,932	2,540	392	13.4	940	3,480	2,239	1,116	1,123	50.2	540	1,656
1950	20	2,989	2,627	362	12.1	2,176	4,803	1,781	803	978	54.8	350	1,153
1951	21	2,810	2,491	319	11.3	1,453	3,944	1,123	707	416	37.0	486	1,193
1952	21	3,263	2,870	393	12.3	1,471	3,341	1,889	936	953	50.4	453	1,389
Totals		43,560	37,474	6,086	13.9	13,394	49,668	12,112	6,189	4,923	40.6	4,449	10,638

The 21 boards in operation in 1952 examined 5,152 candidates. The numbers examined in the four groups are shown in table 38. Physicians, dentists, and medical students represent the greatest number examined. There were 3,263 in this group. Also examined were 276 osteopaths, 195 chiropractors, and 1,418 in the unclassified group. Of all applicants, 26.1% failed, 12% of the physician group examined failed, 15.5% of the osteopaths, 65.1% of the chiropractors, and 55.2% of the unclassified group. Among those who passed, there were 2,870 physicians and others, 233 osteopaths, 68 chiropractors, and 635 unclassified candidates. The basic science boards of Florida examined the greatest number, representing 618 physicians, 35 osteopaths, 8 chiropractors, and 345 others, with an over-all failure percentage of 33. Michigan and Minnesota examined more than 375.

TABLE 41.—*Basic Science Fees*

Alaska	$25	Nebraska	$10 [3]
Arizona	20	Nevada	25
Arkansas	20	New Mexico	25 [4]
Colorado	25	Oklahoma	15 [5]
Connecticut	10	Oregon	10
District of Columbia	25	Rhode Island	10
Florida	10	South Dakota	15 [2]
Iowa	10	Tennessee	10 [1]
Michigan	10 [6]	Texas	15 [2]
Minnesota	15 [2]	Washington	10
		Wisconsin	10 [6]

1. Reciprocity, $5.
2. Reciprocity, $25.
3. Waiver, $15.
4. Reciprocity, $60.
5. Reciprocity, $50.
6. Reciprocity, $15.

The basic science board in Iowa, which reported 435 certified, did not report failure figures. Alaska, Colorado, the District of Columbia, and New Mexico had no failures. It is the policy of the Arizona and Minnesota boards in reporting results of its examinations to omit the names of applicants who fail examinations. The numbers who fail are therefore recorded only in the total column. There were 432 in this group.

Physicians, dentists, and medical students were tested by all boards, osteopaths by 17 boards, chiropractors by 13 boards, while 15 boards included candidates in the unclassified group.

Sixteen boards issued 1,924 certificates by reciprocity, endorsement, waiver, or exemption. The number of successful applicants (5,730) registered by examination and by endorsement is recorded in table 39. Included in the total certified were 4,341 physicians, dentists, and medical students, 423 osteopaths, 118 chiropractors, and 848 others.

In 26 years (table 40) 43,560 physicians, dentists and medical students were examined, of whom 37,474 were successful in their examination. In the same period, 12,112 other practitioners were tested and 6,189 passed. By both examination and endorsement there were 49,668 certificates issued to physicians and 10,638 to other practitioners.

The fees for certification in the basic sciences in the states requiring such certification are given in table 41. Examinations and endorsement meetings are held in most instances semiannually, although some boards meet quarterly.

Basic science legislation has been enacted in order that all who seek to care for sick and injured persons can be tested to determine whether they possess a reasonable knowledge of the sciences fundamental to the healing art.

The results of the examinations indicate that, in general, the group referred to in the foregoing tables as "other practitioners" are not adequately equipped in the fundamentals of medical care. This is particularly significant, since the testing for basic science registration is made by nonmedical examiners.

The present executive corresponding officer of each of the 21 basic science boards is as follows:

Arizona.....Mr. Herbert D. Rhodes, University of Arizona, Tucson
Arkansas.....Mr. Louis E. Gebauer, 1002 Donaghey Building, Little Rock
Colorado.....Dr. Esther B. Starks, 1459 Ogden St., Denver 18
Connecticut...Mr. M. G. Reynolds, Executive Assistant, 110 Whitney Avenue, New Haven 10
District of Columbia.....Dr. James P. Leake, 2733 Ontario Road, N.W., Washington
Florida.....Mr. M. W. Emmel, University of Florida, Box 340, Gainesville
Iowa.....Dr. Ben H. Peterson, Coe College, Cedar Rapids
Michigan.....Mrs. Ann Baker, 423 W. Michigan Ave., Lansing 15
Minnesota....Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis 14
Nebraska.....Mr. Husted K. Watson, Room 1009, State Capitol Building, Lincoln 9
Nevada.....Mr. Frank Richardson, University of Nevada, Reno
New Mexico..Mrs. Marguerite Cantrell, Box 1592, Santa Fe
Oklahoma....Dr. Clinton Gallaher, 813 Braniff Building, Oklahoma City
Oregon.....Dr. Charles D. Byrne, University of Oregon, Eugene
Rhode Island..Mr. Thomas B. Casey, 366 State Office Building, Providence
South Dakota.Dr. Gregg M. Evans, 310 E. 15th St., Yankton
Tennessee.....Dr. O. W. Hyman, 874 Union Avenue, Memphis
Texas.....Bro. Raphael Wilson, 407 Perry-Brooks Building, Austin
Washington...Mr. Edward C. Dohm, Olympia
Wisconsin....Mr. William H. Barber, 621 Ransom St., Ripon
Alaska.....Dr. C. Earl Albrecht, Box 1931, Juneau

NATIONAL BOARD OF MEDICAL EXAMINERS

The certificate of the National Board of Medical Examiners is accepted as an adequate qualification for registration by the medical licensing boards of all the states, including the District of Columbia and the territories, with the following exceptions: Florida and Texas do not accept National Board certification. Arkansas, Indiana and Nebraska have, heretofore, accepted National Board diplomates with the provision that the state board would reread and regrade the examination papers themselves. With the change from essay to objective multiple-choice procedures, recognition has been denied.

TABLE 42.—*Licensing Boards Endorsing the Certificates of the National Board of Medical Examiners, 1953*

Alabama	Illinois [1]	Montana	Puerto Rico
Alaska [3]	Iowa [3]	Nevada	Rhode Island [1]
Arizona	Kansas	New Hampshire	South Carolina
California	Kentucky	New Jersey	South Dakota
Canal Zone	Louisiana [4]	New Mexico	Tennessee [3]
Colorado	Maine [2]	New York	Utah
Connecticut [3]	Maryland	North Carolina	Vermont
Delaware [5]	Massachusetts	North Dakota	Virginia
Dist. of Columbia [3]	Michigan [2]	Ohio	Washington
Georgia	Minnesota [3]	Oklahoma [3]	West Virginia
Hawaii [1]	Mississippi	Oregon	Wyoming [1]
Idaho	Missouri	Pennsylvania	

1. Oral examination required.
2. Brief supplemental written examination required.
3. Examination in basic sciences accepted by state basic science board.
4. Licensure in a state with which Louisiana reciprocates required.
5. Require two years of medical practice.

Some states exact additional requirements, i. e., a basic science certificate, proof of citizenship and an internship of one year. These are general requirements of all candidates for licensure.

New Jersey requires that the grade in each subject be at least 75%, even for those who have obtained a passing average on National Board examinations and have been certified as diplomates. New York State allows only one grade below 70%. Louisiana exempts diplomates from the state examination if they have been licensed in some other state with which Louisiana reciprocates. Supplementary oral examinations are required in Hawaii, Illinois, Rhode Island and Wyoming. A brief supplemental written examination is required in Michigan. Delaware requires two years of medical practice before granting a license.

In addition to the boards of medical licensure, 20 of the states and Alaska have established separate examining boards in the basic sciences. The laws of seven of these boards are sufficiently broad to enable them to accept the examinations of the National Board in lieu of their own. These include the boards of Alaska, Arkansas, Connecticut, Iowa, Minnesota, Oklahoma, and the District of Columbia.

The National Board admits to its examination any student in good standing in medical schools in the United States and Canada that are approved by the Council on Medical Education and Hospitals of the American Medical Association. Sixteen schools require that students take the examinations as part of their own examination and promotion procedures. The medical licensing boards that will endorse the certificate of the National Board of Medical Examiners are listed in table 42.

Graduates of foreign faculties of medicine considered Hospitals of the American Medical Association and which are included in the Council's published listing may be admitted to the National Board's examinations. Exceptions to this general policy may be made for graduates of medical schools in foreign countries not included on the Council's list if they have graduated from a medical school known to have had acceptable standards at the time of graduation and if they have had postgraduate training or experience in the United States of such duration and quality as to be considered acceptable by the National Board. In the following paragraphs data are presented regarding the examinations conducted and the issuance of certificates by the National Board. This is the 31st annual compilation of these statistics.

The National Board of Medical Examiners was founded in 1915 by Dr. W. L. Rodman, who was at that time President of the American Medical Association. Its chief purpose has been to establish a qualifying examination of such high quality that state licensing boards could grant successful candidates a license to practice without further examination. The board has not set itself up as a national licensing board. It is the function of the indi-

TABLE 43.—*National Board Examinations, 1916-1921*

Year	Total Examined	Passed	Failed	Percentage Failed
1916	10	5	5	50.0
1917	40	31	9	22.5
1918	59	51	8	13.8
1919	52	51	1	1.9
1920	108	82	26	24.0
1921	56	48	8	14.2
Totals	325*	268	57	17.5

* Represents eleven examinations.

vidual states to determine who shall practice within their borders and to maintain high standards of medical practice in accordance with their own rules and regulations.

The board's first examination was given in October, 1916. From that date and up to and including a test given in June, 1921, 11 examinations were given and 268 candidates were certified. The numbers examined during this period are recorded in annual figures in table 43. The examination since 1922 has been given in three parts: part 1, a written examination in six basic science subjects; part 2, a written examination in five major clinical divisions and their component subjects or subdivisions; part 3, an oral and practical evaluation of the candidates ability in critical observation, in diagnostic acumen, and in the principles of therapy. The examination in part 3 is divided into four periods, allocated to the following four major elements of general practice: clinical medicine, pediatrics, clinical surgery, and obstetrics and gynecology.

Examinations in the first two parts are held in February and June at medical schools in the United States and Canada. An additional examination in part 2 is held in April and an additional examination in part 1 in September. The examination in part 3 is given under the direction of local subsidiary boards in 30 centers in June of each year and at other times in certain of these centers. During 1952-1953 about half of the examinations in parts 1 and 2 were of the objective, multiple-choice type and about half of the essay type. Beginning in April, 1953, all examinations will be of the objective, multiple-choice type. The dates of all examinations are posted on college bulletin boards and published in THE JOURNAL and in *The Diplomate*, the official publication of the National Board of Medical Examiners.

TABLE 44.—*National Board Examinations in Part 1, 1922-1952*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
January 1952	431	357	43	31	7.2
June 1952	2,544	1,487	841	216	12.4
September 1952	1,014	623	263	128	12.6
Totals	3,989	2,467	1,147	375	9.4
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
1951	3,520	2,153	1,038	329	9.3
1952	3,989	2,467	1,147	375	9.4
Totals	60,498	36,330	18,350	5,818	9.6

The tables that are hereinafter presented refer to the results of examinations in all three parts since 1922, including those who passed and failed examinations and those certified.

A candidate is eligible for part 1 who has completed successfully the first two years of work in an approved medical school. Candidates are required to take all six subjects of part 1 at one examination unless entitled to take an incomplete examination or electing to take a divided examination. An incomplete examination is allowed candidates taking part 1 at the end of their second year in a medical school where the third year curriculum includes courses in one or two subjects of this part. The examinations in the subjects not yet completed are postponed and may be taken at any examination period after the candidate has completed them in his medical school. Such candidates are recorded in these tabulations under the heading "Incomplete Examinations" and are excluded from the calculations referring to the percentage of failures. A divided examination is one which permits the taking of four subjects at one time and the remaining two at a subsequent time. Names of candidates taking divided examinations are not submitted to the Council until the examination is completed.

TABLE 45.—*National Board Examinations in Part 2, 1922-1952*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
January 1952	222	219	0	3	1.3
April 1952	1,371	1,369	0	2	0.1
June 1952	424	413	0	11	2.6
Totals	2,017	2,001	0	16	0.8
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	708	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
1951	2,045	2,017	0	28	1.4
1952	2,017	2,001	0	16	0.8
Totals	30,892	29,467	46	1,379	0.4

A candidate is eligible for part 2 who has passed part 1 and has completed successfully a four year medical course in an approved medical school. A divided or incomplete examination in part 2 is no longer given. To be eligible for part 3 a candidate must (*a*) have passed parts 1 and 2, (*b*) received the degree of doctor of medicine, and (*c*) served at least one year as an intern in a hospital approved for such training by the Council on Medical Education and Hospitals of the American Medical Association, or have served in a laboratory acceptable to the board.

TABLE 46.—*National Board Examinations in Part 3, 1922-1952*

Year	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
1951	1,738	1,708	30	1.7
1952	2,128	2,036	92	4.3
Totals	26,306	25,647	659	2.5

The figures shown in tables 44 and 45 cover details of examinations given in parts 1 and 2 in 1952 and also since 1922. The data presented represent examinations conducted rather than persons examined, since it includes candidates who fail and are reexamined during the same year and those who pass parts 1 and 2 in the same year.

In 1952, 3,989 examinations were given in part 1; 2,467 passed and 375, or 9.4%, failed. There were 1,147 incomplete examinations given. In part 2, 2,017 examinations were held; 2,001 passed, and 16, or 0.8%, failed.

There have been 60,498 examinations given in part 1 since 1922 and 30,892 in part 2. During this period 36,330 passed part 1 and 29,467 passed part 2. In 31 years, there have been 5,818 failures in part 1, or 9.6%, and 1,379 in part 2, 0.4%. The increasing recognition of the National Board's examinations by medical schools is reflected in the figures presented in these two tables, particularly since 1943. The greatest number of examinations were given in part 1 in 1944, when medical schools were operating on an accelerated program. In 1952 the numbers examined in part 1 exceeded all previous years, with the exception of 1944, while in part 2 there were slightly fewer than in 1951, the all-time high figure.

Tests in part 3 in 1952 totaled 2,128, including 2,036 successful examinations and 92, or 4.3%, failures. Results of the examination in this part in 31 years including 1952 are presented in table 46. During this period 26,306 were tested, of whom 25,647 were granted certificates. The percentage of failures in this final examination in 31 years was 2.5. Since the board was founded in 1915, 25,915 certificates have been awarded.

The 2,036 physicians certified as diplomates in 1952 represented 67 medical schools in the United States, 5 in Canada, and 11 foreign faculties of medicine. The names of the schools in the United States and Canada represented and the number of examinees from each are included in table 47.

The figures thus far presented represent examinations given. The number of persons tested during any one year is recorded for the 31 year period in table 48. The classification "passed" or "failed" in cases in which more than one examination has been taken in a given year are based on the results of the last examination during the year in question. Thus, if in 1952 a candidate passed part 1 but at a subsequent examination in 1952 failed part 2, he is computed in this tabulation as a failure. These figures reveal that there were 7,334 who took at least one of the tests of the National Board in 1952. The trend has been steadily upward. In 1952 the number of candidates examined was greater than any other year. In all, 105,161 persons were examined in one or more of the annual

TABLE 47.—*Diplomates from Individual Medical Schools, 1952*

United States	
College of Medical Evangelists	41
Univ. of Southern California	12
Stanford University	6
University of California	2
University of Colorado	3
Yale University	57
Georgetown University	101
George Washington Univ.	72
Howard University	23
Emory University	8
Chicago Medical School	25
Northwestern University	26
Stritch School of Medicine	7
University of Chicago	23
University of Illinois	25
Indiana University	4
State University of Iowa	10
University of Louisville	1
Tulane University	12
Johns Hopkins University	15
University of Maryland	13
Boston University	58
Harvard Medical School	134
Tufts College Medical School	94
University of Michigan	4
Wayne University	1
University of Minnesota	15
University of Mississippi	1
St. Louis University	8
Washington University	15
Creighton University	14
University of Nebraska	11
Dartmouth Medical School	3
Albany Medical College	43
State University of New York, New York City	99
University of Buffalo	62
Columbia University	101
Cornell University	71
New York Medical College	115
New York University	127
University of Rochester	52
State University of New York, Syracuse	49
University of North Carolina	4
Duke University	75
University of North Dakota	2
University of Cincinnati	2
Western Reserve University	11
Ohio State University	9
University of Oregon	2
Hahnemann Medical College	73
Jefferson Medical College	23
Temple University	88
University of Pennsylvania	30
Woman's Medical College	22
University of Pittsburgh	3
Medical College of South Carolina	6
University of South Dakota	5
Meharry Medical College	8
Vanderbilt University	1
Southwestern Medical School	1
Baylor University	2
University of Utah	5
University of Vermont	30
University of Virginia	4
Medical College of Virginia	2
University of Wisconsin	2
Marquette University	18
Canada	
Dalhousie University	3
Queen's University	3
University of Western Ontario	3
University of Toronto	7
McGill University	22
Foreign	
Harvard Medical School, Shanghai	1
Pennsylvania Med. School, Shanghai	1
University of London	3
Egyptian University, Cairo	1
University of Iceland	1
National Univ. of Ireland	1
University of Dublin	3
American Univ. of Beirut	7
Univ. of Amsterdam	1
Univ. of the Philippines	1
University of Geneva	2
Total	2,036

examinations, of whom 84,729 passed, 13,936 took incomplete examinations, and 6,496, or 6.2%, failed.

In 1952, there were 2,678 licenses to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners in 42 states, the District of Columbia, Alaska, Hawaii, and Puerto Rico. The number registered by each of these licensing boards is recorded in table 49. Since 1915, there have been 22,837 licenses issued on the basis of endorsement of the board's certificate by the various licensing boards.

The National Board of Medical Examiners has gained wide recognition as an influential and important factor in maintaining ever higher standards of medical education and in testing with the utmost thoroughness the physician's qualifications for the practice of his profession. Its examinations have gained increasing popularity among medical students, medical schools and state boards of medical licensure.

From the point of view of the student, the National Board examinations have the advantage that they are set up in three parts, and may be taken during the course of training in the medical school when the student is fresh from his preparation in the various subjects included in the medical curriculum. Later, when he applies for a license to practice, he can then produce evidence of his qualification in these subjects even though his study of many of the details may have occurred years before.

TABLE 48.—*Parts 1, 2, and 3, Excluding Duplications, 1922-1952*

Year	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,965	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
1950	6,596	5,630	665	301	4.5
1951	6,602	5,601	699	302	4.5
1952	7,334	6,204	729	401	5.5
Totals	105,161	84,729	13,936	6,496	6.2

The National Board has not set itself up as a national licensing body. It recognizes that it is the function of the individual states to determine who shall practice within their borders and to maintain high standards of medical practice in accordance with their own rules and regulations. The state licensing boards receive applications after the completion of the formal training, when the physician seeks a license to practice his profession.

An increasing number of medical schools find it desirable to require the examinations of the National Board of Medical Examiners for all their students, thus providing an additional, completely, impartial, objective and well established evaluation of the student's progress. There are sixteen such schools from New England to California. These schools not only provide an advantage for their students in anticipation of licensure, but also, by virtue of the manner in which the results are now being analyzed, the school itself has a useful yardstick by which it may compare the training in its several departments with that of other schools.

TABLE 49.—*Licenses Granted on the Basis of National Board Certificates, 1952*

Alabama	14	New Hampshire	29
Arizona	13	New Jersey	145
Arkansas	6	New Mexico	5
California	316	New York	761
Colorado	20	North Carolina	54
Connecticut	137	North Dakota	5
District of Columbia	86	Ohio	90
Georgia	13	Oklahoma	9
Idaho	9	Oregon	22
Illinois	56	Pennsylvania	175
Indiana	14	Rhode Island	24
Iowa	25	South Carolina	5
Kansas	15	South Dakota	6
Kentucky	19	Tennessee	12
Maine	19	Utah	9
Maryland	70	Vermont	13
Massachusetts	222	Virginia	36
Michigan	40	Washington	28
Minnesota	46	West Virginia	12
Mississippi	3	Wisconsin	8
Missouri	37	Alaska	5
Montana	3	Hawaii	11
Nebraska	3	Puerto Rico	28
		Total	2,678

The membership of the board (38) includes representation from the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, the armed forces, the Veterans Administration, and the Federation of State Medical Boards. Members at large are elected from among leaders in medical education throughout the country. The officers of the board are:

Howard T. Karsner, M.D., President
Robert W. Keeton, M.D., Vice President
John P. Hubbard, M.D., Executive Secretary and Treasurer
J. Stewart Rodman, M.D., Medical Secretary
Everett S. Elwood, Editor and Consultant on State Board Relations.

The address of the board is 133 South 36th Street, Philadelphia 4.

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MEDICAL LICENSURE

The 51st annual report on medical licensure prepared by the Council on Medical Education and Hospitals appears in this issue of THE JOURNAL. Data are presented in the first section concerning the medical examination and the licensure of physicians in the United States and its territories and outlying possessions for 1952. In addition, the report summarizes trends in licensure over many years. Current regulations pertaining to medical licensure are also presented. The boards of examiners in the basic sciences are discussed in the second section of the report and, lastly, the National Board of Medical Examiners.

In 1952, a total of 13,228 licenses to practice medicine and surgery were issued by the 54 boards authorized by law to grant licenses to practice the art and science of medicine. The 13,228 licenses issued last year represented 6,212 granted after written examination and 7,016 granted by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners. The number of licenses issued annually continues to exceed the prewar years. The increase in the number of licenses issued last year as compared with 1951 totaled 1,290, representing an increase of 499 by written examination and 791 by endorsement of credentials.

Licentiates of 1952 who received their first license to practice medicine and surgery during the calendar year and who represent additions to the medical profession numbered 6,885. In 1952 there were 3,829 deaths of physicians reported to the offices of the American Medical Association. Thus the physician population in the United States and its territories and outlying possessions was increased by 3,056. The physician population increase in 1952 exceeded that of 1951 by 849.

Estimated figures indicate that on December 31, 1952, the total number of physicians in continental United States was 214,667. This figure includes 151,363 engaged in private practice; 6,677 in full-time research and teaching; 28,366 interns, residents, and physicians engaged in hospital administration; 8,166 physicians retired or not in practice; and 20,095 in the government services.

Last year 799 examination failures were reported. Failures by graduates of approved medical schools in the United States amounted to 2.7%, by graduates of medical schools in Canada, 7%, and by graduates of approved medical schools no longer in operation 50%. In the latter group, four were examined. The percentage of failures in three other groups: foreign faculties of medicine, unapproved medical schools, and schools of osteopathy were 46.3, 73.3, and 19.6% respectively.

The preprofessional and professional educational requirements of each licensing board are included in the study and also the states requiring an internship for licensure, regulations pertaining to the registration or licensure of interns and residents, schedule of written examination dates and reciprocity meetings, medical license fees, licensure on governmental credentials, fees, annual registration, temporary permits, and limited licenses.

The report pertaining to the results of examinations given by the 21 boards of examiners in the basic sciences reveals that certificates were issued to 5,730 candidates in 1952. Of the 5,152 listed by examination, 3,806 were successful and 1,346, or 26.1%, failed. Of the physicians, medical students, and dentists examined, 12% failed. Of the osteopaths, chiropractors, and unclassified candidates, 15.5, 65.1, and 55.2%, respectively, failed. Sixteen boards issued 1,924 certificates by reciprocity, endorsement, waiver, or exemption. The number certified by basic science boards was 593 greater than in the previous year.

The last series of tabulations refers to the examinations given by the National Board of Medical Examiners. The certificate of the National Board is recognized by all medical licensing boards for registration by endorsement, with the exception of Arkansas, Florida, Indiana, Nebraska, and Texas. The change in the method of examination from the essay to the multiple choice examination has resulted in the recent discontinuance of recognition by Arkansas, Indiana, and Nebraska. There were 6,024 persons who took at least one of the tests of the National Board in 1952, and 2,036 were certified as diplomates. The number so certified was 328 greater than in 1951. In 1952, there were 2,678 licenses to practice medicine issued by endorsement of the Board's certificate by 46 boards.

The presentation of this study is made available through the cooperation of the various examining and licensing boards. For their cooperation the Council and THE JOURNAL wish to express appreciation.

LICENSURE OF FOREIGN-TRAINED PHYSICIANS

A review of the annual report on medical licensure indicates that the state licensing boards are lending their efforts to assist the qualified foreign-trained physician to locate in the United States. Forty-five boards now will permit foreign-trained physicians to be examined under varying conditions. Twenty-six boards require full citizenship, and 13 require that the applicants file their intention to become citizens. Twenty-nine boards indicate

such physicians must serve an internship in an approved hospital in the United States. Eighteen boards have specific requirements for physicians educated abroad and 19 report varying exemptions. The Council presents these data in factual form for the assistance of the foreign-trained physician seeking licensure in the United States. The report emphasizes that medical licensure in this country is a "'state right" and is entirely under the jurisdiction of the governments of the individual states and that, while it is hoped the data presented may be informative, official information concerning the acceptability of foreign credentials should be obtained directly from the licensing boards.

The list compiled by the Council and the Executive Council of the Association of American Medical Colleges of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools in the United States and Canada has been a helpful guide to licensing boards. Fifty schools in 14 countries are included in the present listing, which is revised to February, 1953. In this report the Council calls attention to the fact that the list is tentative and that other schools may be added as information is collected that justifies their inclusion. In the preparation of the initial list in February, 1950, and its three subsequent revisions, the two agencies named have had the cooperation of an Advisory Committee on Foreign Credentials, made up of a large group of outstanding persons representing medical education, educational foundations, licensing bodies, various governmental agencies, and other organizations interested in the problems of foreign-trained physicians. The Council acknowledges the list to be tentative and states that its position with respect to schools not named in the list is that they neither approve nor disapprove them. Therefore, the credentials of graduates of schools not listed must be evaluated on an individual basis.

Twenty-six licensing boards report the acceptance of the list in the consideration of applicants for licensure. Sixteen of these boards accept only graduates of the schools on the list, and three boards accept the list with specific reservations. The remaining seven boards did not specify whether they also accept graduates of other schools. Foreign-trained physicians are not eligible for licensure in nine states.

In 1952, graduates of foreign faculties of medicine were examined for medical licensure by 37 boards. Graduates of 160 medical schools and 3 licensing corporations were examined. Graduates of medical schools in the Philippines, 15 South and Central American countries, 28 countries in Europe, and 6 in Asia were represented at examinations. The number examined totaled 1,208. The number who were successful was 648; failures numbered 560, or 46.3%.

Additions to the medical profession from this group of licentiates last year numbered 569, of whom 545 were licensed by examination and 41 by endorsement of credentials. The report indicates that in the three year period from 1950 to 1952 inclusive, 1,531 foreign-trained physicians were licensed to practice medicine in the United States, of whom 1,327 were licensed for the first time and thus represent additions to the medical profession in this country.

IATROGENIC HEART DISEASE

The entity currently known as iatrogenic heart disease is, as the adjective signifies, caused by physicians. It is from the physician that the patient receives the impression that he has heart disease. This may occur as the result of direct statements or acts of the physician or indirectly by the patient's interpretation of certain words or actions of the physician. The patient most fearful of heart disease is the one in whom symptoms that fix the thought of heart disease in his mind and perpetuate his fears are most likely to develop. While there are no conclusive statistics to indicate the frequency of this condition, several reports point to its importance, ranging from the conservative estimate of Friedman,[1] who found that at least 10% of the hundreds of cases he examined were either caused or "fixed" by some physician, to the claim of Oille [2] that almost 60% of patients who consult a cardiologist suffer from an exaggerated or wholly unnecessary anxiety about their hearts, arising from suggestion and not based on reason.

The manifestations of iatrogenic heart disease are those commonly produced by anxiety and include palpitation, fatigability, breathlessness, and precordial pain. As in any of the forms of anxiety neurosis, however, other manifestations may occur, such as apprehension, syncope, dizziness, trembling, tachycardia, paresthesias, and cold, clammy hands and feet. According to Weinberg,[3] the diagnosis of iatrogenic heart disease is based on three criteria: the patient must have symptoms; the symptoms must be due to fear of heart disease brought on by the words or acts of a physician; and the heart itself is normal, although questionable or equivocal symptoms or findings may exist. Among these are innocent murmurs, minor electrocardiographic variations, unimportant blood pressure variations, benign arrhythmias, and cardiac-like symptoms of noncardiac origin with normal cardiovascular findings.

According to Weinberg, successful treatment of iatrogenic heart disease depends on complete reassurance of the patient. Along with emphatic reassurance as to the soundness of the patient's heart, the patient should be made to understand that his symptoms are caused not by any disease of the heart but by fear and that the symptoms are not dangerous to life, regardless of how distressing they may be subjectively. The occurrence of iatrogenic heart disease among patients can be effectively prevented by physicians who are constantly on their guard against misinterpretation by patients of innocuous statements; ill-considered remarks and acts by physicians; and the avoidance of errors by physicians in interpreting symptoms and findings.

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1. Friedman, M.: Functional Cardiovascular Disease, Baltimore, Williams & Wilkins Company, 1947.

2. Oille, J. A.: Cardiac Neuroses, Canad. M. A. J. 45: 1, 1941.

3. Weinberg, H. B.: Iatrogenic Heart Disease, Ann. Int. Med 38: 9 (Jan.) 1953.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

Except for the remarks I shall make to the House of Delegates this is my last official message as President. On June 2 I shall turn over my office to Dr. Edward J. McCormick of Toledo, Ohio. The next President's Page will be his. I bespeak for him the wholehearted support and cooperation of the entire profession. Medicine cannot remain a free and independent profession without unity. Unity does not bar differences of opinion nor free discussions, which are healthy in any organization. Only by such discussions and exchanges of opinion can we hope to evolve a satisfactory policy. Unity means that, after full discussion and decision on a policy, we unite to carry it out and that we support those officials who are entrusted with carrying out the policy. No association is ever going to adopt or adhere to any policy that is at variance with the will of the majority of its members. That will must be made known, however, and it can only be known if the members take an active part in their local state and national associations.

As I said on this page several months ago, every member of the Association has the right to appear before the reference committees of the A. M. A. House of Delegates to support or oppose any resolution, report, or proposed policy. Few take advantage of this privilege. Every member has a vote and the right to participate actively in the affairs of his county society. Again, too few exercise that prerogative. A medical society is exactly what its members make it. A county medical society should point the way to health progress in the community. Its members should be leaders in all movements pertaining to health. No one can provide the leadership in community health that the doctor can, but, if he does not exert that leadership, someone else will. If the county society is not actively supported by its members it will lose its influence in the community.

We must face conditions as they are and not as we might like to have them. Medicine cannot be practiced now as it was 50 or even 25 years ago. Medicine in becoming more scientific has become more complex. We have become, in my opinion, overspecialized. This has raised difficulties in some areas in providing general practitioner care. The principle of prepayment of medical care has become accepted. All these and many other factors make it essential that every doctor concern himself not only with his scientific advancement but with the social and economic phases of medicine as well. Unless the doctor gives them due consideration, there will be increasing attempts by government to interfere in medical care.

In December I outlined the points in our medical care system that needed special attention. But we can accomplish our aim only by the efforts of the entire profession.

Although I have discussed these things at various times, I believe it is worth while to enumerate them once more and repeat that they are a goal toward which we must aim.

1. Development of programs for the care of those suffering from chronic and degenerative disease.
2. Programs for the medical care of the indigent for all areas along the plan now in operation in several areas.
3. Expansion of public health services to areas now lacking it within the approved policies of the American Medical Association.
4. Better distribution of physicians by having the communities needing and lacking physicians provide facilities to attract them.
5. Expansion of our voluntary insurance program by covering more persons, an increasing number over age 65, and providing for financially catastrophic illness.
6. Development of more community health councils with physician leadership.
7. Further extension of emergency call systems.
8. Further development of grievance or mediation committees, with a backing up of their recommendations by the county societies.
9. Inculcation on newly trained physicians of the traditions and ethics of medicine.
10. Revitalization of our county societies to make them influential leaders in health in their communities.
11. A better balance between general practice and specialization, with greater stress on the importance of the former.
12. A facing up to realities in the doctor-hospital relationship and a cooperative attitude on the part of both in solving the present difficulties.
13. Closer integration of civilian and military medicine.
14. A solution of the vexing problems inherent in the present veterans' laws.

This may seem a large order, but all these problems can be solved, and their solution not only will bring about further improvement in the level of medical care in this country—already the best in the world—but also will remove forever the dangers of socialization of medicine.

I do not pretend to know the answers to the difficulty of the armed services in obtaining sufficient medical personnel. Part is certainly due to a "hangover" of resentment at the wastage of personnel during the last war, which has now to a large extent been eliminated. Part is due to poor public relations as to the attractions of a military career in medicine. Part is due to injustices that were inherent in the present "Doctor-Draft law" and in its administration. It is hoped that the new law will eliminate these injustices. Americans as a class are patriotic, and the doctors are no exception to the general rule. If a doctor knew he would have to serve in the military forces for a definite length of time and knew when he would have to do it (barring an all-out war), he could plan accordingly and there would be less difficulty. It is the present uncertainty as to both duration and time of this service that has caused so much trouble. Also, a doctor, unless he chooses the military service as a career, does not want to be recalled except in war.

It must be remembered that when a doctor established in practice is called to the colors his practice has disappeared when he returns and he has to start over again. It is particularly hard on him if he has to do this twice within a few years. He is not of the status of the person who has a job waiting for him or who can seek employment with a going organization. His practice is a personal affair built up by time and experience, and he has to make an investment in equipment, funds for which he often does not have. Eventually, the flow of recent graduates should be sufficient to fill the needs of the armed forces, although unless the services succeed in obtaining a steady flow into the regular corps, a certain number of older physicians will be needed. Permitting regular officers to resign after a period of three to five years will help, also. An orderly arrangement of call and a constant educational program as to what the services can offer are essential. Furthermore, there must be close cooperation developed between the civilian and military physician, such as liberal use of civilian consultants by the military, integration of the military physician into local civilian medical organizations, and a solution of the dependent medical care program with justice to all concerned.

The non-service-connected disability situation in the Veterans Administration is another thorny problem. It is true that the present law is the basis of much of the difficulty, but it is also true that administration of the present law is at fault in at least some areas. The solution is in revision and clarification of the law, and I do not believe much can be accomplished without it. No one would deny a veteran with a service-connected disability anything, but, unless the trend in other benefits is curbed, the whole economy of the country may well be wrecked.

And now, *ave atque vale!*

LOUIS H. BAUER, M.D., Hempstead, N. Y.

ORGANIZATION SECTION

PHYSICIANS ON COUNCIL'S FIELD STAFF

With the appointment of Drs. Arthur N. Springall and Joseph J. A. McMullin, the Council on Medical Education and Hospitals now has nine full-time physicians on its field staff. Each staff member has been assigned a geographic area and will review, on a biannual basis, the internship and residency programs in approved hospitals. This increase in staff will expedite the processing of new applications for approval of internships and residencies and make possible a review of currently approved programs at least once every two years.

At present the Council conducts the inspection program relating to the approval of hospitals for internship and residency training—a joint effort of the specialty boards, the American College of Physicians, and the American College of Surgeons. In addition, the professional staff will assume responsibility for surveys in behalf of the Joint Commission on Accreditation of Hospitals. Others on the staff who will be visiting hospitals throughout the country include: Drs. William R. Albus, Joseph R. Anderson, Fernald C. Fitts, Charles C. Hedges, Thure A. Nordlander, Frank W. Ryan, and William W. Southard.

NEW TRANSCRIPTION SERIES— CONTRIBUTIONS OF A. M. A. TO HEALTH

Common health problems and how the American Medical Association has helped to solve them form the basis of a new series of radio transcriptions from the Bureau of Health Education. The 13-program series, "Yours for Health," shows how the work of various A. M. A. councils and committees has contributed to better health for the American people. Subjects include: (1) How Do We Know? Facts and Statistics; (2) Food and Nutrition; (3) The Part Played by Drugs; (4) Impaired Hearing and Hearing Aids; (5) Training Good Doctors; (6) You and Your Hospital; (7) It's the Law; (8) Defense Against Poisons; (9) Safe Cosmetics; (10) Meeting Medical Costs; (11) Health and the Aged; (12) Driving Out the Quacks; and (13) Mental Health.

COUNTY SOCIETY DATA AVAILABLE

The third biannual survey of county medical society activities has been completed by the Council on Medical Service and is available on request. This year the survey covered a broader scope of activity in the field of medical service than previously, and results have been tabulated to show these activities by size of society. County societies may obtain, from the Council, general information on specific medical service programs and lists of societies where such programs have already been put into operation.

CIVIL DEFENSE BIBLIOGRAPHY

A complete bibliography of published literature dealing with the medical aspects of civil defense is being compiled by the Council on National Emergency Medical Service. This list will be available about July on request from the Council.

RURAL HEALTH BULLETIN

"Parade of Progress," a newsletter carrying items of interest to rural health leaders, will be published this month by the Council on Rural Health. The news sheet, which will appear periodically, will be sent to a special list of state rural health committee chairmen, agricultural extension service personnel, and farm organization leaders.

NEW "M.D." TELEVISION SERIES

A new 26 week series of five minute television programs, entitled "M.D." and produced by F. William Hart in cooperation with the American Medical Association, will begin on Monday, June 1, over all 45 stations of the NBC-TV network. The series will be presented as a public service by the National Broadcasting Company and E. R. Squibb & Sons.

The "M.D." program, featuring helpful health advice brought by "your family physician and his county medical society," will be presented as a five minute portion of the Dave Garroway "Today" show every Monday morning from 7 to 9 a. m. (EDT and CDT). As the cooperating agency in production of the series, the A. M. A. has the right to clear all scripts, review the films, and pass on all national sponsors. Whenever the programs are televised locally, the county medical society will have the right to approve local sponsors.

THE SCIENTIFIC EXHIBIT, ST. LOUIS CLINICAL MEETING, DEC. 1-4, 1953

Arrangements are in progress for the Scientific Exhibit at the Clinical Meeting of the American Medical Association in St. Louis, Dec. 1-4, 1953. The Chairman of the Subcommittee on Scientific Exhibit is O. P. J. Falk, M.D., 3608 Washington Blvd., St. Louis 8, Mo. The Scientific Exhibit will be correlated as far as possible with the various sections chosen for the meeting, and the subchairmen from St. Louis will act in an advisory capacity for the various section groups as follows:

Medicine	Ralph A. Kinsella, M.D.
Surgery	Carl A. Moyer, M.D.
Pediatrics	Peter Danis, M.D.
Obstetrics and Gynecology	Robert Crossen, M.D.
Tuberculosis	Paul Murphy, M.D.
Cardiovascular Disease	Arthur E. Strauss, M.D.
Arthritis	R. O. Muether, M.D.
Dermatology	G. V. Stryker, M.D.
Gastrointestinal Diseases	Jos. W. Larimore, M.D.
Neuropsychiatry	Edwin F. Gildea, M.D.

Applications blanks for space in the Scientific Exhibit are now available and may be obtained from any of the physicians mentioned above or from the Director, Scientific Exhibit, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

HOW TO GET A DOCTOR

A booklet directed toward communities seeking a physician, "A Doctor for Your Community," will be published in June by the American Medical Association. This pamphlet describes the problems involved in obtaining a physician, the things a community can do to attract and keep a doctor, and examples of what other communities are doing. A joint project of the Council on Rural Health, Council on Medical Service, and Department of Public Relations, the booklet will be available to state medical societies for distribution to communities listed with their placement services. In addition, the Council on Medical Service has compiled information from numerous state placement services in a reprint, which will be especially useful to state societies interested in expanding their activities in this area.

FEDERAL MEDICAL LEGISLATION

Equalization Pay for Physicians Entering Armed Services

Senator Hunt (D., Wyo.) proposes in an amendment to S. 1531 (the Doctor-Draft bill) to extend to July 1, 1955, the period during which volunteer physicians and dentists entering the armed services would receive throughout their period of service $100 a month equalization pay above base pay and allowances for subsistence and quarters. Otherwise, physicians and dentists entering the armed forces voluntarily after June 30, 1953, would receive $1,200 a year less than similar physicians and dentists entering prior to this date. The original statute was enacted to equalize over a period of years the total pay of a medical officer (and dentist) compared to the total pay of line officers. The difference in total pay was accounted for by the older age of the medical and dental officers entering the service because of their longer preparation. This was referred to the Senate Armed Services Committee. At the Senate committee hearings on May 18 the Department of Defense stated they were in favor of the $100 equalization pay, but it had not yet been cleared by the Bureau of the Budget.

STATE MEDICAL LEGISLATION

Alabama

Bills Introduced.—H. 184 and S. 68 propose an appropriation to the state superintendent of education for the purpose of contracting with Tuskegee Institute for undergraduate instruction of Alabama residents in a four-year professional course leading to the **Bachelor of Science degree in nursing.** H. 107 and S. 9 propose to make it an act of **unprofessional conduct for a chiropodist** to start a practice of chiropody in a commercial place of business or to take over an established practice of chiropody in a commercial place of business or to buy a professional place of business and establish a branch of chiropody therein.

California

Bills Enacted.—A. 1372, has become ch. 441 of the laws of 1953. It provides that from the first day of July, 1952, to the first day of August, 1953, any **physician and surgeon authorized to practice in any other state** is authorized to perform any professional services that a physician's and surgeon's certificate will permit him to perform upon any boy scouts, scout masters, scout leaders, or any person employed by the Boy Scouts of America, while enroute within the state of California and while attending the third National Jamboree of the Boy Scouts of America to be held July 17-23, 1953, in the state of California. S. 1134, has become ch. 360 of the laws of 1953. It provides that whenever a ward of the juvenile court under the supervision of the probation officer has no parent guardian or person standing *in loco parentis* capable or willing to authorize remedial care or treatment for the ward the court may order that the probation officer may **authorize such medical, surgical, or dental care for the ward** by licensed practitioners, as may from time to time appear necessary.

Connecticut

Bills Enacted.—H. 493, has become public act no. 106 of the acts of 1953. It provides for the establishment of an advisory committee on **hospital licensing** and amends the general licensing law by providing that any hospital which was exempt from licensure prior to Oct. 1, 1953, shall be granted a temporary license by the department which shall be valid until Dec. 31, 1953. H. 494, was approved April 28, 1953. It amends the law concerning death certificates by substituting the word **"fetal death"** for the word "still birth" and requires fetal death certificates rather than still birth certificates.

Florida

Bills Introduced.—H. 854, proposes to authorize the boards of county commissioners of all counties of a certain size to expend up to $5,000 annually for a **mental health and guidance program** in the county. H. 975, proposes to make it unlawful for any employer to require any employee or applicant for employment to pay **the cost of a medical examination** or the cost of furnishing any records required by the employer as a condition of employment. S. 661, proposes the creation of a **Florida sanitarians registration examination and advisory board** to examine and register persons desiring to practice as sanitarians. The practice of a sanitarian is defined as the practice of a service requiring use and knowledge of the physical sciences such as chemistry, bacteriology, biology, physics and other inter-related subjects rendered or offered to be rendered for public or private work as a sanitarian wherein the health of the general public may be or is now partly dependent upon the inspectional duties of such an individual. S. 663, proposes as appropriation by the city of Jacksonville for the rendering of services to indigent citizens suffering from **incurable diseases or disabilities** or other maladies requiring hospitalization.

Bill Enacted.—S. 26, was approved May 8, 1953. It appropriates 5 million dollars to the state board of control for the construction, equipping, and furnishing of a **medical and nursing school building** at the University of Florida.

Hawaii

Bill Introduced.—S. 730, relating to the qualifications of the medical director of the territorial hospital, proposes that the **requirements for licensure may be waived** with the consent of the governor if no qualified applicants for position of medical director are available locally.

Illinois

Bills Introduced.—S. 417, proposes to authorize the department of public health to establish and enforce **minimum standards** for the operation of all **general hospitals.** S. 421, proposes that all officers, agents, or employees of the state who make **inspections relating to the health,** welfare, or safety of the people and prepare reports thereon shall file a photostatic copy of such reports with the department of labor. S. 434, proposes the creation of a commission to study problems relating to the granting of **limited licenses** under the medical practice act, to determine whether the medical practice act is being administered in accordance with the wishes of the General Assembly, and to study methods employed by the department and the **examining committee** appointed pursuant to the medical practice act in determining the reputability and good standing of any professional school, college, or institution. S. 441, proposes that whenever a doctor shall **examine or treat a person who is blind he shall report** the name of such person to the department of public welfare within 90 days after the case first comes to his attention. The word "doctor" is defined as including a physician, oculist, ophthalmologist, optometrist, or any other person who in the course of the practice of his profession examines the human eye.

Iowa

Bill Enacted.—S. 205, was approved April 29, 1953. It provides that where any **artificial sweetening product such as saccharine or sulfamate** is used by any person in the manufacture or sale of any article of food intended for human consumption, the container in which any such food or beverage is sold shall be clearly labeled with the name of the sweetening product used and the portion of the store where such food or beverage is diplayed shall be identified by an appropriate sign, reading "For Dietary Purposes."

Maine

Bill Enacted.—H. 659, was approved May 7, 1953. It makes it unlawful for any employer to require any employee or applicant for employment to bear **the medical expense of an examination** when such examination is ordered or required by the employer.

Massachusetts

Bills Introduced.—H. 2689, proposes to increase the scope of a special committtee in **investigating narcotic drugs** so that such committee may also consider the problems of the adulteration or misbranding of foods and drugs. H. 2673, proposes the creation of a special commission to make an investigation and study of the feasibility of the commonwealth of Massachusetts and the various cities and towns of the commonwealth jointly purchasing **group hospital insurance** coverage for the protection of welfare recipients and dependent children. S. 443, proposes to authorize the committee on public welfare to make an investigation and study relative to assistance to persons who are permanently disabled especially with reference to **services of physicians for certain permanently and totally disabled persons.**

Michigan

Bill Introduced.—H. R. 36, proposes the creation of a special committee to study the laws relating to **admission to mental hospitals** for the purpose of recommending amendments thereto at the next regular session of the legislature.

Bill Enacted.—S. 1261, has become public act no. 67 of the acts of 1953. It amends the Medical Practice Act by providing, among other things, that the board shall have the power to grant **temporary annual licenses** to practice medicine, surgery, and midwifery to doctors of medicine who are residents of the state but who are Canadian citizens and graduates of approved colleges of medicine of the Dominion of Canada, who apply for citizenship in the U. S. Such temporary annual licenses shall be renewable for a period of not to exceed five years. The law also permits the board to grant temporary annual licenses to doctors of medicine who enter the U. S. under Displaced Persons Act, are residents of the state, apply to be registered and certified, and who satisfactorily comply with the requirements for such registration and certification, excepting the requirement of the United States citizenship, in lieu of which such applicants shall furnish satisfactory proof of having declared their intention to become citizens of the United States or have filed a petition for naturalization.

The summary of federal legislation was prepared by the Washington Office of the American Medical Association and the summary of state legislation by the Bureau of Legal Medicine and Legislation.

Minnesota

Bills Enacted.—H. C. R. 16, was adopted April 21, 1953. It directs the legislative research committee to report to the 1955 legislature on administrative changes in the **mental health program.** H. 1192, has become ch. 673 of the laws of 1953. It provides for the pre-sentence social, **physical, and mental examinations** of persons convicted of sex crimes. H. 1242, has become ch. 637 of the laws of 1953. It provides that any county and city-county operating a public hospital may indemnify officers, nurses, physicians, and other employees for loss or expense arising from **malpractice or negligence claims** for damage made upon such officers, nurses, physicians, or other employees, based on their activities while in the performance of their public duties in the treatment of patients in such public hospital and defend in the names of or on behalf of such officers, nurses, physicians or other employees any suits brought against them to enforce claims arising out of such activities. S. 1535, has become ch. 617 of the laws of 1953. It proposes regulations for providing financial **assistance to certain needy individuals.** "Assistance" means money payments for medical care and "medical care" means medical, dental, surgical, or hospital nursing or licensed nursing home care provided or prescribed by persons authorized by law to give such care.

Missouri

Bills Enacted.—S. 71, was approved April 24, 1953. It makes it a misdemeanor for a person to habitually use or to become addicted to the **use of narcotic drugs.** S. 75, was approved April 28, 1953. It makes it unlawful for any person to manufacture, possess, sell, prescribe, or adminster any apparatus, device, or instrument for the unauthorized **use of narcotic drugs,** with certain exceptions. S. 165, was approved April 21, 1953. It repeals and reenacts the law relating to the licensure of **registered professional nurses** and **licensed practical nurses.** S. 237, was approved May 7, 1953. It makes it unlawful for any licensed physician and surgeon to perform an **autopsy or postmortem examination** upon the remains of any person without the consent of one of the following: the deceased, if in writing, and duly signed and acknowledge prior to his death; the surviving spouse; or the surviving child, parent, brother or sister, or relative or friend who assumes responsibility for disposition of remains. Any licensed physician or surgeon performing an autopsy or postmortem examination with the consent of any of the above enumerated persons shall use his judgment as to the scope and extent of the autopsy to be performed and shall be in no way liable for such action.

New Jersey

Bill Enacted.—A. 422, has become ch. 148, of the laws of 1953. It amends the workmen's compensation act by permitting payment for **chiropractors services** rendered to employees.

North Carolina

Bills Enacted.—H. 139, was ratified April 30, 1953. It provides an allocation of the student loan fund for the making of **loans to students in the schools of medicine and nursing who are specializing in psychiatry.** No such loan would be made to any person in excess of $2,000 for each scholastic year not to exceed four years. Under rules promulgated by the North Carolina Medical Care Commission, any loans made under this law shall be cancelled on the basis of a credit of the amount of one-years' loan for each year of satisfactory service performed as a member of the staff of the state hospital at Butner, the state hospital at Goldsboro, the state hospital at Morganton, or the state hospital at Raleigh. S. 316, was ratified April 29, 1953. It rewrites the statutes relating to the education and licensing of **registered nurses** and licensed **practical nurses.** S. 419, was ratified April 30, 1953. It amends the tort claim act by providing that the act shall not have the effect of creating any liability on the part of the state or any of its departments, institutions or agencies, which provide medical, surgical, dental and nursing, or other **professional services by doctors, surgeons, dentists, nurses, or others,** on account of the professional services of such persons or any injuries received on account thereof. S. 439, was ratified April 30, 1953. It provides for the appointment of a committee to investigate and study the advisability and feasibility of establishing **a program of nurse training** at one of the several state-supported educational institutions.

Ohio

Bills Introduced.—HR 109, proposes the creation of a committee to make an inquiry and investigation into any and all matters pertaining to the **state medical board.** H. 256, relates to the reorganization of the state boards for the licensing of various professions. Among other things, it would place the state board of medical examiners within the jurisdiction of the department of health for administrative purposes. H. 809, proposes the appointment of a **state board of naturopathic examiners** and defines "naturopathy" as a system of the healing arts and science, embracing diagnosis, prevention and treatment of human ills, disease, traumas, deformities, and functions of the human body by the use of any or all agencies of nature, for the prevention and preservation of health.

Bill Enacted.—S. 33, was approved April 10, 1953. It authorizes the attorney general to make a comprehensive study of the existing provisions of law relating to the **control of narcotics and their use;** to evaluate present law enforcement, penal and rehabilitative procedures, and the adequacy thereof, and to make recommendations for such law and procedure as may be necessary and desirable to insure adequate control of narcotics and their use, cope with the problems arising from addiction, and to improve law enforcement, penal, and rehabilitative procedures in connection therewith.

Oklahoma

Bills Introduced.—H. 1162, proposes the creation of a **Division of Criminal Investigation** which shall have the authority to investigate all major crimes within the State, to maintain proper criminal records, to maintain and conduct a criminal laboratory which shall provide scientific aid to law enforcement agencies, and to conduct and provide a training school for sheriffs and their authorized deputies. H. 1176 and S. 447 propose that a **statement of fact or opinion on a subject of science or art contained in published treatise, periodical, book, or pamphlet** shall, in the discretion of the court, and if the court finds that it is relevant and that the writer of such statement is recognized in his profession or calling as an expert on the subject, be admissible in actions of contract or tort for malpractice, error or mistake against physicians, surgeons, psychiatrists, dentists, optometrists, and hospitals, as evidence tending to prove said fact or as opinion; provided at least ten (10) days notice in writing shall be given the opposing party or his counsel of the intention to use such treatise, periodical, book, or pamphlet. H. 1195, proposes the enactment of an **Oklahoma regulated drug act** and defines the term "regulated drug" as including any narcotic drug, any barbiturate, any amphetamine, marihuana, and any dangerous drug. In general the proposal would make it unlawful for any person to compound, grow, prepare, or by any other method produce a regulated drug, or sell it or dispense it or otherwise furnish it, unless it is obtained from or on the prescription of a licensed practitioner. H. 1198 and S. 452 propose regulations for the creation and operation of **county boards of health.**

Bills Enacted.—H. 624, was approved April 8, 1953. Among other things, **it defines narcotic drugs** as meaning coca leaves, or opium or any compound, salt or derivative preparation of coca leaves, or opium, including any synthetic compound whatever which has similar action or effect upon the human body, whether or not they are known or described by copyrighted or chemical names. H. 738, was approved April 13, 1953. It provides for the creation of an Oklahoma **board of nurse registration and nursing education** to have charge of the licensing of registered practical nurses.

Pennsylvania

Bills Introduced.—H. 1259, proposes that in any court case where it appears to the judge that a reasonable necessity exists for temporary restraint for one alleged to be mentally ill in order **to permit an examination of such person by two qualified physicians** to determine the propriety of a certificate attached to a petition for commitment, the judge may by order restrain such person in a suitable place for not more than six hours prior to the examination or 24 hours thereafter. S. Serial No. 130, proposes a resolution memorializing the Congress of the United States to continue the country's historical record and policy of providing medical and hospital care for every veteran suffering from service-connected disabilities, or if not so connected, such veterans who are without personal funds for such medical and hospital care.

South Carolina

Bill Enacted.—H. 1319, has become act no. 188 of the acts of 1953. It amends the law relating to **physical therapy** by authorizing the board to register as a physical therapist any person who applies for such registration before July 1, 1953, who furnishes with such application satisfactory proof of moral character and that he or she has resided in and has been engaged in active practice in the state as a physical therapist for at least 10 years, who establishes to the satisfaction of the board that he or she has practiced ethically and in a competent manner only under the direction, supervision, and prescription of a person licensed to practice medicine and surgery and who has been approved as a physical therapist by the county medical society of the county in which he or she resides.

Tennessee

Bill Enacted.—H. 799, has become ch. 113 of the public acts of 1953. It amends the medical practice act in a number of particulars. Among other things, it authorizes the board to accept a certificate diplomate of the **National Board of Medical Examiners** in lieu of an examination. It also amends the law relating to the licensing of hospitals by **defining the term "physician"** as including graduates of recognized osteopathic colleges holding the degree of doctor of osteopathy and a license to practice osteopathic medicine.

Texas

Bill Introduced.—H. 907, proposes regulations providing for the creation of **county-wide hospital districts.**

Vermont

Bill Introduced.—H. 422, to amend the law relating to narcotic drugs, proposes to **define narcotic drugs** as including drugs to which the federal narcotic laws apply and drugs found by the commission to have an addiction-forming or addiction-sustaining liability similar to morphine or cocaine.

West Virginia

Bills Enacted.—H. 272, was approved March 20, 1953. It amends the law relating to workmen's compensation, by, among other things, providing that the term "injury" and "personal injury" shall be extended to include **silicosis** and any other occupational disease as defined in the act. S.C.R. 9, was adopted March 7, 1953. It creates an interim committee to conduct a thorough study and survey of the problem of **alcoholism,** and alcoholic and drug addicts as a basis for enactment of constructive legislation on the subject.

MEDICAL NEWS

COLORADO

Alumni Clinics.—The Colorado Medical Alumni Association of the University of Colorado School of Medicine will hold its annual meeting at the University of Colorado Medical Center in Denver, June 5. The morning will be devoted to ward rounds and case discussion in the major clinical departments. In the afternoon the following program will be presented in the Sabin Amphitheater:

Arrhemoblastoma—Report of Two Cases, Scott A. Gale, Pueblo.
Treatment of Asthma in Children, Salmon R. Halpern, Dallas, Texas.
Nonperforative Trauma to the Abdomen, John C. Cottrell, Long Beach, Calif.
Skin Cancer Observations as Seen in Denver for the Last 25 Years (colored slide illustrations), Osgoode S. Philpott, Denver.
Proctologic Examination, David N. Yaker, Los Angeles.
Paroxysmal Ventricular Tachycardia Treated with Intravenous Quinidine, Lewis E. January, Iowa City.

An alumni-senior softball game will be played on the campus at 4 p. m. The banquet at the Albany Hotel will be preceded by a "Dutch treat" cocktail hour.

DISTRICT OF COLUMBIA

Society News.—The George Washington University Medical Society will hold a luncheon June 3, 12:30 p. m., at the Hotel Commodore, New York, during the A. M. A. Convention. Tickets ($4) may be obtained by mailing check to: Dr. Richard H. Fischer, Secretary-Treasurer, 915-19th St., N.W., Washington 6, D. C.

Freedmen's Hospital Interns and Residents.—The annual meeting of the Association of Former Interns and Residents of Freedmen's Hospital, Washington, D. C., which will be held at the hospital June 1-4, will be a memorial meeting for the late Dr. William A. Warfield, who served the hospital as surgeon-in-chief for 35 years. Dr. Warfield was among the first four interns to train at the hospital in 1894. He retired as surgeon-in-chief, Nov. 17, 1936, and died Dec. 18, 1951. Scientific sessions will open at the hospital on Tuesday. Entertainment includes a blind bogey tournament, Monday, 10:30 a. m., at the Langston Golf Course, Oklahoma Avenue and Benning Road, N.E., an outing at the Sewell Ranch, Norbeck, Md., and a dance at National Airport.

ILLINOIS

Camps for Children with Heart Disease.—A list of summer camps that will accept children with heart disease has been compiled by the Chicago Heart Association, 69 W. Washington St., Chicago 2 (FInancial 6-4675). Applications for camp reservations should be made as soon as possible.

Lecture in Winnetka.—On June 3 at 8 p. m. Dr. Benjamin Boshes, professor of nervous and mental diseases, Northwestern University Medical School, Chicago, will speak on the "Nervous System (Headache)" at the North Shore Health Resort, 225 Sheridan Road, Winnetka, in the series of lectures on "Understanding Psychosomatic Disorders."

Chicago

Grant for Cardiac Research.—The Hektoen Institute for Medical Research has received a grant of $10,000 from the Otho S. A. Sprague Memorial Institute. The money will be used for research in congenital heart disease and acquired valvular heart disease, under the direction of Drs. Egbert H. Fell and Benjamin M. Gasul and their associates.

University News.—Dr. Paul B. Szanto, associate director, senior pathologist at Cook County Hospital since 1946, has been appointed clinical assistant professor of pathology in the University of Illinois College of Medicine. Dr. Szanto, who recently was appointed chief pathologist of the Chicago State Tuberculosis Sanitarium, taught at Northwestern University between 1946 and 1952.

KANSAS

Fluoridation of Water Supplies.—The cities of Lawrence and Paolo have begun fluoridation of their municipal water supplies, bringing to 14 the number of Kansas communities using fluoridated water. According to Willard R. Bellinger, D.D.S., director of the division of dental hygiene, Kansas State Board of Health, Topeka, in all but one of the Kansas towns now using fluoridation, the annual per capita cost ranges from 5 to 14 cents. These figures are based on the cost of the fluoride compound and amortization of the chemical feed equipment over a 20 year period, the normal expected life of such equipment.

MICHIGAN

Dr. Stapleton Honored.—At the Wayne University Alumni reunion in Detroit, Dr. William John Stapleton Jr., emeritus professor of jurisprudence, ethics and economics, and medical history, Wayne University College of Medicine, Detroit, received an alumni award for outstanding service and achievement. Dr. Stapleton, who conducts the "By the Way" column and edits the series "100 Books for the Doctor" in the *Detroit Medical News,* was associate dean of Wayne's College of Medicine for 10 years and acting dean for 2 years.

Health Department Certifies Resorts.—The Michigan Department of Health is issuing to approved tourist hostelries green and gold signs reading "HDA—Health Department Approved," which will serve as guideposts to travelers seeking clean, safe resort accommodations. The signs are issued to summer resort hotels, cabin camps, cabin courts, motels, tourist courts, or groups of three or more cottage units rented for periods of two weeks or less throughout the resort season, which comply with standards of sanitation recommended by the Michigan Department of Health. They certify that resorts displaying the signs provide safe drinking water, clean toilets, clean and well-ventilated buildings, windows and doors that are adequately screened to keep out flies and mosquitoes, and safeguards for protection against common hazards, and that, in establishments that also serve food, the milk is properly pasteurized and good food handling practices are followed. Approved resorts also provide enough floor space to prevent overcrowding, windows to furnish sufficient natural light, safe disposal of garbage and other wastes, beaches free from hazardous sewage pollution or contamination, and clean, safe bathing areas free from rocks and holes. Noxious plants such as poison ivy, poison oak, and poison sumac are either eliminated or controlled, so that patrons can avoid them. Local health departments will inspect resorts in their areas to determine whether they meet the standards required for approval. In areas not served by a local health department, limited assistance can be obtained from the state health department in getting establishments approved.

MISSISSIPPI

State Medical Meeting at Biloxi.—The annual meeting of the Mississippi State Medical Association was held at the Hotel Buena Vista in Biloxi, May 11-14, under the presidency of Dr. G. Lamar Arrington, Meridian. Out-of-state essayists included Drs. Curtis H. Tyrone, Robert F. Sharp, Lawrence J. O'Neil, and John H. Dent, New Orleans; Dr. Everett L. Pirkey, Louisville, Ky.; Dr. Benjamin B. Wells, Little Rock, Ark.; Dr. P. Robb McDonald, Philadelphia; Dr. Lester A. Brown, Atlanta, Ga.; Dr. F. Bayard Carter, Durham, N. C.; and Dr. Joseph B. Miller, Mobile, Ala. The public meeting on Tuesday was addressed by Dr. Louis H. Bauer, Hempstead, N. Y., President of the American Medical Association, and the

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Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

Honorable Hugh L. White, governor of Mississippi. The presidential address was delivered at this meeting, and Dr. John P. Culpepper Jr., Hattiesburg, gave the distinguished service oration.

Personal.—Dr. Henry Pinkerton, professor of pathology, St. Louis University School of Medicine, recently delivered the 16th Christian Fenger Lecture on "New Horizons in Virus Research" at a meeting in Chicago sponsored jointly by the Chicago Pathological Society and the Institute of Medicine. ——Dr. Jerome I. Simon, president of the St. Louis Medical Society, has been named president of the Doctors' Medical Foundation in St. Louis and Dr. William G. Becke, vice-president.——Dr. C. Barber Mueller, assistant professor of surgery and Markle Fellow in Surgery, and Dr. Robert Joy Glaser, assistant professor of medicine, have been named assistant deans of Washington University School of Medicine, St. Louis.——Dr. David B. Wilson, Jackson, who has been with the Mississippi Commission on Hospital Care since 1951, has been made director of the 350 bed university teaching hospital under construction in Jackson.

NEBRASKA

Crippled Children's Clinics.—Summer clinics for crippled children have been scheduled as follows: June 6, Lexington High School; June 20, Scottsbluff, St. Mary Hospital; July 11, Norfolk State Hospital; July 25, McCook, St. Catherine of Sienna Hospital; Aug. 8, North Platte, Knights of Columbus Building; Aug. 15, Chadron, Elks Club; and Aug. 29, Hastings, Mary Lanning Memorial Hospital.

Fifty Year Club.—At its annual meeting in Omaha the Nebraska State Medical Association awarded 50 year pins to Drs. Silas G. Allen, Stanton; William R. Boyer, Pawnee City; Murt M. Sullivan, Spalding; J. Stanley Welch, Lincoln; and Charles A. Rydberg, Litchfield.

NEW YORK

Health Conference at Lake Placid.—The New York State Department of Health announces that the annual health conference at Lake Placid, June 1-4, will consider developments in the prevention of poliomyelitis, accident prevention, and heart disease. Monday will be devoted to the annual meeting of the New York State School Physicians and School Nurse Teachers associations. The opening general session Tuesday will be addressed by Dr. Wilton L. Halverson, San Francisco, president of the American Public Health Association, and director of the California State Department of Public Health, Dr. Andrew A. Eggston of Mount Vernon, president, New York State Medical Society, and Dr. Herman E. Hilleboe, Albany, state health commissioner. At the cardiac session Wednesday the following presentations will be made: "Predisposing Factors to Coronary Heart Disease," Ancel B. Keys, Ph.D., Minneapolis; "Some Current Views on Management in Coronary Heart Disease," Dr. Robert L. Levy, New York; and "Effects of Social and Emotional Stress in Heart Disease," Dr. Mandel E. Cohen, Boston. Dr. Joseph T. Doyle, director of the Cardiovascular Health Center, Albany Medical College, will discuss the research projects being conducted by the center, especially the program for heart disease control among state employees. Discussions on the role of gamma globulin and vaccines in the prevention of poliomyelitis will be presented by Dr. Alexander D. Langmuir, Atlanta, chief epidemiologist, communicable disease center, U. S. Public Health Service; Dr. Earle G. Brown, Mineola, Nassau County commissioner of health; and Dr. Robert F. Korns, Albany, director of the state health department's Bureau of Epidemiology and Communicable Disease Control.

New York City

Lectures on Metabolism.—On June 5 the division of neoplastic diseases, Montefiore Hospital, will present "The Metabolism of Estrogenic Substances" by Lewis L. Engel, Ph.D., Boston, and "The Metabolism of Natural Steroids" by Ralph I. Dorfman, Ph.D., Shrewsbury, Mass.

Care of Children with Orthopedic Handicaps.—The Bureau for Handicapped Children, New York City Department of Health, has made available to interested persons and institutions its recently published "Standards Recommended for Hospital Care of Children with Orthopedic Handicaps." Requests should be sent to Dr. Helen M. Wallace, Director, Bureau for Handicapped Children, City of New York Department of Health.

OHIO

Alumni Banquet in New York.—During the A. M. A. annual meeting, the Ohio State University Medical Alumni will hold a banquet at the Hapsburg House, 313 E. 55th St., New York, June 3. Reservations may be made through the Alumni House on the Ohio State University Campus, Columbus.

Personal.—Dr. Earl H. Stanley, Jackson, president-elect of the Jackson County Medical Society, was recently appointed medical director at the construction project for the atomic plant in Pike County.——Dr. Jonathan Forman, Columbus, editor of the *Journal of the Ohio State Medical Association*, has been elected president of the National Garden Institute, which attempts to interest amateurs in the pleasures and healthful benefits to be gained from gardening.

OKLAHOMA

History of Medicine Meeting.—Plans are being made for a meeting of representatives of the department of archives at the University of Oklahoma with the president of the university, dean of the medical school, and others interested in the history of medicine in Oklahoma. Physicians with interesting historical documents are requested to notify Dr. Lewis J. Moorman, chairman, History of Medicine Committee, Oklahoma State Medical Association, 1200 N. Walker St., Oklahoma City.

PENNSYLVANIA

Commission on Geriatrics.—The Medical Society of the State of Pennsylvania announces the creation of a commission on geriatrics, which will have to do with the medical aspects of care of the aged and also will serve in an advisory capacity to the state legislature and other lay groups. Dr. B. Franklin Rosenberry, Palmerton, chairman, states that the first concern of the commission is "to help educate the general practitioner in a better knowledge of the medical problems seen in their older patients."

Hospital News.—In a surprise ceremony at a Lehigh Valley Regional Fracture meeting at St. Luke's Hospital, Bethlehem, the surgical staff presented an oil portrait of chief surgeon Dr. William L. Estes Jr. to the hospital. Dr. George J. Curry, Flint, Mich., spoke on "Transportation and Emergency Treatment of the Injured: Before and After Hospital Admission"; Dr. Alexander P. Aitken, Boston, on "Rehabilitation of the Injured at the National Level: Plan for Application"; and Dr. Josephine J. Buchanan, Washington, D. C., on "Hospital Rehabilitation Techniques."

Pittsburgh

Eye Bank Established.—Through a grant from the McClintic Endowment, the Eye, Ear, Nose, and Throat Hospital has opened a new department, the Eye Bank of Pittsburgh, so that any person in Western Pennsylvania who needs eye transplant surgery may have the operation. The major functions of the bank are the collection, preservation, and distribution of eye tissues for such operations. Information may be obtained by writing to the Eye Bank of Pittsburgh, Eye, Ear, Nose, and Throat Hospital, 230 Lothrop St., Pittsburgh 13.

RHODE ISLAND

Hospital News.—The Miriam Hospital, Providence, formerly located on Parade Street, is now located in its new building on Summit Avenue near Fifth Street. The hospital, which consists

of 150 beds and 30 bassinets, has planned for expansion that will add 210 adult beds and 30 bassinets. There are five operating rooms, five laboratories, and a nine room x-ray suite.

Summer Camps.—A new directory of summer camps for Rhode Island's boys and girls is now available through the Council of Community Services at 100 N. Main St., Providence. The booklet, priced at 50 cents, lists and describes 75 resident, day, and week-end camps in the state, with sponsors, facilities, and fees. Also included are a limited number of camps outside Rhode Island.

TEXAS

Society News.—At its annual meeting May 12, the Dallas Southern Clinical Society installed the following officers: president, Dr. J. Warner Duckett, vice-president, Dr. Perry C. Talkington, secretary, Dr. T. Haynes Harvill, treasurer, Dr. Alvin Baldwin Jr., and director of clinics, Dr. Lawrence B. Sheldon.

Recordings of Telephone Broadcasts.—Recordings have been made of the first two in the series of four postgraduate telephone broadcasts sponsored by the Council on Medical Education and Hospitals of the Texas Medical Association (*J. A. M. A.* **151**:484 [Feb. 7] 1953). Each program ("Peptic Ulcer—Modern Concepts" and "Poliomyelitis—Evaluation of Present Status") has been recorded on two 33⅓ rpm platters with 15 minutes on each side. Rental fee per program is $10. Records may be purchased for $25 per program from Mr. N. C. Forrester, Executive Secretary, Texas Medical Association, 1801 Lamar Blvd., Austin.

VERMONT

Dinner at A. M. A. Meeting.—Graduates of the College of Medicine, University of Vermont, and members of the Vermont State Medical Society attending the A. M. A. annual meeting will meet at the Columbia University Club (43rd Street, just west of 5th Avenue on the south or downtown side) June 3 for a "Dutch treat" cocktail party, 5:30 p. m., and dinner ($5), 7 p. m. (ladies invited to both). Two-week guest privileges will be extended to those who plan to attend the dinner. Reservations are essential and may be made through Dr. Theodore H. Harwood, Assistant Dean, College of Medicine, University of Vermont, Burlington.

GENERAL

Vascular Surgeons Meet in New York.—The Society for Vascular Surgery will hold its annual meeting at the Hotel Pierre in New York May 31, under the presidency of Dr. Geza de Takats, Chicago, who will deliver the presidential address on "Anticoagulant Therapy" at 2 p. m. Seventeen papers will be presented.

Course in Cerebral Palsy.—A special course in cerebral palsy, limited to physicians only, will be given at the Cook County Graduate School of Medicine (707 S. Wood St.) June 15-26, under the direction of Dr. Meyer A. Perlstein, Chicago. Enrollment in the course is limited. Applications should be sent directly to the registrar of the school.

Journal for Plastic Surgeons.—Publication has been announced of a quarterly journal entitled *Revista Latino Americana de Cirugia Plastica (Latin American Journal of Plastic and Reconstructive Surgery)*. Representing the United States on the board of executives are Drs. Herbert Conway, New York, and Paul W. Greeley, Chicago. Subscriptions ($5 per year) should be sent to Revista Latino Americana de Cirugia, Tuxpan #23, Mexico, D. F.

Women's Clubs Promote Physical Examinations.—The General Federation of Women's Clubs, 1734 N St., N.W., Washington 6, D. C., has announced a contest to promote complete physical examination once a year for every member of their clubs (twice a year if over 50). Three citations will be awarded to the state federations reporting, before March 1, 1954, the largest percentage of clubs attaining 100% participation of their membership. Information may be obtained from the Chairman of the Welfare Department, Mrs. Samuel Levy, 124 Washington St., Natchitoches, La.

Medical Stamp Exhibit.—Physicians throughout the country are invited to enter stamps in the Medical Stamp Exhibit co-sponsored by the Cleveland Health Museum and the Garfield Perry Stamp Club of Cleveland, July 11-27. Dr. Abram B. Bruner, Cleveland, will serve as consultant. Acceptable categories include stamps concerned with medicine and surgery, medical schools and laboratories, medical congresses, U. S. commemorative medical portraits, public health, drugs, Red Cross, disaster and relief, cancer, tuberculosis, nurses, and child welfare. Entry blanks may be obtained up to June 15 from the Cleveland Health Museum, 8911 Euclid Ave., Cleveland 6.

Conference of State Medical Officials.—The Conference of Presidents and Other Officers of State Medical Associations will hold its annual meeting, May 31, 1:45 p. m., in the Astor Gallery, Waldorf-Astoria, New York, under the presidency of Dr. J. Stanley Kenney, New York. Addresses will be delivered by Dr. Louis M. Orr, Orlando, Fla., past president, Florida Medical Association, who is president-elect of the conference; Rev. Frank W. Price, D.D., Richmond, Va.; Carrol M. Shanks, LL.B., Newark, N. J., president, the Prudential Insurance Company of America; and Hon. John Marshall Butler, LL.B., Baltimore, senior U. S. senator from the State of Maryland. The Armour Laboratories of Chicago will be host at a reception and cocktail party for officers of state medical associations and their wives in the Sert Room, 5:30 p. m.

Carol Lane Awards for Traffic Safety.—The National Safety Council announces that, through a grant of the Shell Oil Company, Carol Lane awards will be presented annually to individual women and to women's or parents' clubs to reward women's achievements toward the preservation of lives through traffic safety programs in their community or state. The first prize, consisting of a $1,000 defense bond and a bronze "safety Oscar," will be presented to the woman, as well as to the club, organizing and fostering the most outstanding traffic safety program in a community or state. Three additional women and clubs will receive honorable mention awards consisting of a plaque containing a bronze bas-relief of the "safety Oscar." Awards will be presented at the National Safety Congress in Chicago in October. All entries for the 1953 awards must be made on the official entry blank by June 30. Entry blanks and a brochure giving complete information about the awards may be obtained by writing to: Miss Alice Catherine Mills, Director of Women's Activities, National Safety Council, 425 N. Michigan Ave., Chicago.

Pediatric Residency Fellowships.—The American Academy of Pediatrics will grant 12 or more fellowships ($500 to $1,000) for pediatric residents for a period of six months to one year. These fellowships, made possible by a grant to the academy from Mead Johnson & Company, will be granted as of Jan. 1 each year. Following are the criteria for the awards: (1) a letter from the chief of service, indicating that the proposed person has completed, or will have completed by Jan. 1, one year of pediatric training credited by the American Board of Pediatrics, that the resident has performed his work ably, and that there is real need for financial assistance; (2) a letter from the resident requesting the fellowship, stating that he intends to enter pediatric private practice at the conclusion of his second year of training. Consideration will be given to geographic spread of appointments, so that all sections of the country will be represented, and preference will be exhibited for well-qualified but smaller training centers, which perhaps have fewer resources for assisting residents in training than do some of the larger centers. Research interests and accomplishments and desire to enter academic pediatrics are not criteria for the awards. Deadline for receipt of applications, Sept. 1. Apply to Dr. James G. Hughes, Le Bonheur Children's Hospital, Adams and Dunlap, Memphis 5, Tenn.

Cardiology Meeting in Washington.—The second annual convention of the American College of Cardiology, June 7-9, will be held at the Hotel Statler, Washington, D. C. Dr. Bruno Kisch, New York, president of the association, will deliver the opening address Monday morning, after which the following program will be presented:

Who Is a Cardiac? Walter S. Priest, Chicago.
Analysis of History Taking in Cardiovascular Diseases, Louis F. Bishop, New York.
The History and Physical Examination in the Recognition of Heart Disease, Benjamin Manchester, Washington.
Diagnosis of Heart Failure in Children, Sidney E. Blumenthal, New York.
Roentgenologic Aspects in the Diagnosis of Heart Disease, John B. Schwedel, New York.
Differential Diagnosis of Heart Disease in Pregnancy, Simon Dack, New York.
Differential Diagnosis of Anterior Chest Pain, Samuel Blinder, New York.
Clinical Diagnosis of the Syndrome of Bernheim, Henry I. Russek, Staten Island, N. Y.
Diagnosis of Congenital Heart Disease, Daniel F. Downing, Philadelphia.
Diagnosis of Pulmonary Stenosis With and Without Interauricular Septal Defect, Benjamin M. Gasul, Chicago.
Differential Diagnosis of Anomalous Left Coronary Artery, Samuel O. Sapin and Sidney E. Blumenthal, New York.
Selection of Cases for Commissurotomy, O. Henry Janton, Philadelphia.
Selection of Patients Suitable for Cardiopericardiopexy, Samuel A. Thompson, New York.
Recognition of Postoperative Vascular Complications, Lester Blum, New York.
Diagnosis of Neuropsychiatric Complications in Patients Undergoing Cardiac Surgery, B. Marvin Hand, Philadelphia.
New Method of Measuring Cardiac Output, Hubert Mann, New York.

The annual banquet will be held in the Presidential Ballroom Monday, 7 p. m. ($7.50 per cover), and the Board of Governors reception and dinner meeting will be held in the Pan American Room Tuesday at 6:30 p. m. There will be an exhibit on the electron microscope research project of the college as well as exhibits on ballistocardiography, mitral commissurotomy, and new limits of normal blood pressure.

Society News.—At its annual meeting in Atlantic City the American Heart Association installed Dr. Robert L. King, Seattle, as president and named Dr. E. Cowles Andrus, Baltimore, president-elect.——At its annual meeting in Cleveland the American Society of Maxillofacial Surgeons elected Dr. William F. Harrigan, New York, president; Dr. Clifford L. Kiehn, Cleveland, vice-president; and Dr. Casper M. Epsteen, Chicago, secretary-treasurer.——The Society of Neurological Surgeons elected the following officers at its annual meeting in New Orleans: Dr. Ottiwell W. Jones Jr., San Francisco, president; Dr. W. James Gardner, Cleveland, vice-president; Dr. Edgar F. Fincher, Emory University, Ga., secretary-treasurer; and Dr. A. Earl Walker, Baltimore, historian.——The American Psychiatric Association, at its annual meeting in Los Angeles, elected Dr. Kenneth E. Appel, Philadelphia, president; Dr. Arthur P. Noyes, Norristown, Pa., president-elect; Dr. R. Finley Gayle Jr., Richmond, Va., secretary; Dr. Howard W. Potter, Brooklyn, treasurer; and Dr. Arthur Milsap Gee, Essondale, British Columbia, Canada, auditor.——The following officers were elected at the annual meeting of the Industrial Medical Association in Los Angeles: president, Dr. George F. Wilkins, Boston, president-elect, Dr. Robert Collier Page, New York, vice-presidents, Drs. Kieffer D. Davis, Bartlesville, Okla., and Eli S. Jones, Hammond, Ind., secretary, Dr. Arthur K. Peterson, Chicago, and treasurer, Dr. Edward C. Holmblad, Chicago.——At its annual meeting in Portland, Ore., the North Pacific Society of Neurology and Psychiatry elected Dr. Gordon H. Hutton, Vancouver, British Columbia, president; Dr. William Y. Baker, Seattle, president-elect; and Dr. Robert A. Coen, Portland, Ore., secretary-treasurer. Dr. Percival Bailey, Chicago, guest speaker, gave addresses on "The Future of Visceral Brain" and "Structure and Function of the Cerebral Cortex."——At the annual meeting of the American Laryngological Association in New Orleans, the following officers were elected: president, Dr. Gordon F. Harkness, Davenport, Iowa, vice-presidents, Drs. Claude C. Cody, Houston, Texas, and Daniel S. Cunning, New York, secretary, Dr. Harry P. Schenck, Philadelphia, treasurer, Dr. Fred W. Dixon, Cleveland, historian and editor, Dr. Bernard J. McMahon, St. Louis. The 75th annual meeting of the association will be held at the Statler Hotel, Boston, May 20-21, 1954.——The Association of Medical Directors, a group comprising heads of the medical departments of approximately 40 U. S. pharmaceutical manufacturers, has chosen Dr. Justus B. Rice, New York, director of medical research, Winthrop-Stearns, Inc., as president; Dr. Elmer L. Sevringhaus, medical director of Hoffmann-La Roche, Nutley, N. J., vice-president; and Dr. Norman L. Heminway, Bloomfield, N. J., Schering Corporation, secretary-treasurer (reelected).——At its annual meeting in St. Louis, the American Radium Society elected Edith H. Quimby, D.Sc., New York, president; Dr. John E. Wirth, Pasadena, Calif., president-elect; Drs. H. Dabney Kerr, Iowa City, and Grant H. Beckstrand, Long Beach, Calif., vice-presidents; Dr. Robert E. Fricke, Rochester, Minn., secretary; and Dr. Douglas J. Roberts, Hartford, Conn., treasurer. The next annual meeting of the society will be at The Homestead, Hot Springs, Va., March 14-16, 1954.

HAWAII

Society News.—At its annual meeting the Honolulu County Medical Society elected the following officers, all of Honolulu: president, Dr. William S. Ito, vice-president, Dr. Clarence M. Burgess, secretary, Dr. Richard C. Durant, and treasurer, Dr. John M. Felix. The next annual meeting will be held April 2, 1954.

FOREIGN

Seminar on Zoonoses.—A European seminar on zoonoses (animal diseases transmissible to man), recently sponsored in Vienna by the European Regional Office of the World Health Organization and the Food and Agriculture Organization (for consideration of bovine tuberculosis, brucellosis, leptospirosis, Q fever, and rabies), was attended by 60 senior medical and veterinary officials from 20 European countries.

Congress on Tropical Medicine.—The International Congresses of Tropical Medicine and Malaria will be held at Istanbul, Turkey, Aug. 28 to Sept. 4 (the meeting was originally scheduled for Sept. 2-8). Topics for discussion will include malaria, trypanosomiasis, virus diseases, schistosomiasis, rickettsial diseases, filariasis, and nutrition. Dr. Richard R. Overman, Ph.D., associate professor of physiology, University of Tennessee Medical Units, Memphis, will present a report based on research in tropical diseases and malaria conducted at the university from 1945 to 1950.

Neurologists Meet in Munich.—The German Society of Neurology, German Society of Neurosurgery, and German Society of Neurologists and Psychiatrists will hold a combined meeting in Munich Aug. 26-29. Full-day discussions will be held on each of the following topics: technique of narcosis, meningitis, development of psychiatry in the United States during the last three decades, and psychodiagnostics. The cerebellum will be the subject considered by the German Neuropathological Society, which will meet concurrently in Munich Aug. 26-27. Information may be obtained from Dr. Ehrhardt, Univ.-Nervenklinik, Marburg/Lahn, Germany.

CORRECTIONS

Management of Acute Pancreatitis.—In the article by this title in THE JOURNAL, May 2, 1953, the author inadvertently failed to acknowledge that the fractional epidural blocks, to which reference is made in the lower left hand column on page 3, were performed by Dr. Leroy W. Krumperman and other members of the Department of Anesthesiology of Temple University School of Medicine in Philadelphia.

Hydralazine.—In the title and throughout the text of the clinical note by Kaufman (*J. A. M. A.* **151**:1488-1490 [April 25] 1953) "hydrallazine" should read "hydralazine." In the first and second footnotes, the capital "L" appearing in the chemical term "L-Hydrazinophthalazine" is incorrect and should be replaced by the numeral "1."

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.
1953 Annual Session, New York, June 1-5.
1953 Clinical Session, St. Louis, Dec. 1-4.
1954 Annual Session, San Francisco, June 21-25.
1954 Clinical Session, Miami, Florida, Nov. 30-Dec. 3.

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Sitka, July 15-17. Dr. William P. Blanton, P. O. Box 2569, Juneau, Secretary.

AMERICAN COLLEGE OF CARDIOLOGY, Hotel Statler, Washington, D. C., June 7-9. Dr. Philip Reichert, 480 Park Ave., New York 22, Secretary.

AMERICAN COLLEGE OF CHEST PHYSICIANS, Hotel New Yorker, New York, May 28-31. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Executive Director.

AMERICAN DERMATOLOGICAL ASSOCIATION, Lake Placid Club, Lake Placid, N. Y., June 9-13. Dr. Louis A. Brunsting, 102 Second Ave. S.W., Rochester, Minn., Secretary.

AMERICAN DIABETES ASSOCIATION, Hotel Commodore, New York, May 30-31. Dr. John A. Reed, 11 West 42d St., New York 36, Secretary.

AMERICAN GYNECOLOGICAL SOCIETY, Lake Placid Club, Lake Placid, N. Y., June 15-17. Dr. John I. Brewer, 104 South Michigan Ave., Chicago, Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, Barbizon-Plaza Hotel, New York, May 29-31. Dr. Elizabeth R. Fischer, 10848 South Fairfield Ave., Chicago 43, Secretary

AMERICAN NEUROLOGICAL ASSOCIATION, Hotel Claridge, Atlantic City, N. J., June 15-17. Dr. H. Houston Merritt, 710 West 168th St., New York 32, Secretary.

AMERICAN ORTHOPEDIC ASSOCIATION, The Homestead, Hot Springs, Va., June 20-July 1. Dr. George O. Eaton, 4 East Madison St., Baltimore 2, Secretary.

AMERICAN PROCTOLOGIC SOCIETY, Hotel Statler, Boston, June 10-13. Dr. Stuart T. Ross, 131 Fulton Ave., Hempstead, N. Y., Secretary.

AMERICAN SOCIETY FOR THE STUDY OF STERILITY, Henry Hudson Hotel, New York, May 25-31. Dr. Walter W. Williams, 20 Magnolia Terrace, Springfield 8, Mass., Secretary.

AMERICAN THERAPEUTIC SOCIETY, The Biltmore, New York, May 28-31. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

AMERICAN VETERINARY MEDICAL ASSOCIATION, Royal York Hotel, Toronto, Canada, July 20-23. Dr. J. G. Hardenbergh, 600 South Michigan Blvd., Chicago 5, Executive Secretary.

CONFERENCE OF PRESIDENTS AND OTHER OFFICERS OF STATE MEDICAL ASSOCIATIONS, New York, May 31. Mr. Thomas R. O'Brien, 634 North Grand Blvd., St. Louis 3, Secretary.

IDAHO STATE MEDICAL ASSOCIATION, Sun Valley, June 14-17. Dr. Robert S. McKean, 305 Sun Bldg., Boise, Secretary.

MAINE MEDICAL ASSOCIATION, Eastland Hotel, Portland, June 21-24. Mr. W. Mayo Payson, 142 High St., Portland 3, Executive Secretary.

MEDICAL LIBRARY ASSOCIATION, New House Hotel, Salt Lake City, June 16-19 Miss Louise C. Lage, Lilly Research Laboratories, 740 South Alabama St., Indianapolis 6, Secretary.

PACIFIC DERMATOLOGIC ASSOCIATION, Olympic Hotel and University of Washington, Seattle, July 9-10. Dr. Ervin H. Epstein, 447 29th St., Oakland 9, Calif., Secretary.

ROCKY MOUNTAIN CANCER CONFERENCE, Denver, July 8-9. Mr. Harvey T. Sethman, 835 Republic Bldg., Denver 2, Secretary.

SOCIETY FOR INVESTIGATIVE DERMATOLOGY, Belmont Plaza Hotel, New York, May 30-31. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

SOCIETY FOR VASCULAR SURGERY, Hotel Pierre, New York, May 31. Dr. George D. Lilly, 25 S.E. Second Ave., Miami 32, Fla., Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION, Alex Johnson Hotel, Rapid City, June 14-16. Dr. G. I. W. Cottam, 300 First National Bank Bldg., Sioux Falls, Secretary.

SOUTHERN OREGON MEDICAL SOCIETY, Oregon Caves Chateau, Oregon Caves, Ore., June 10. Dr. R. Ray Johnson, Grants Pass, Ore., Secretary.

SOUTHWEST ALLERGY FORUM, Hotel Muehlebach, Kansas City, Mo., June 14-16. Dr. Frederic Speer, 2601 Parallel Ave., Kansas City 4, Kans., Secretary.

STUDENT AMERICAN MEDICAL ASSOCIATION, Edgewater Beach Hotel, Chicago, June 15-17. Mr. Russell F. Staudacher, 535 North Dearborn St., Chicago 10, Executive Secretary.

UPPER PENINSULA MEDICAL SOCIETY, Escanaba, Mich., June 19-20. Dr. N. L. Lindquist, 1103 Ludington St., Escanaba, Mich., Secretary.

WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, Biltmore Hotel, Los Angeles, June 10-13. Mrs. L. Amy Darter, Division of Laboratories, State Department of Public Health, Berkeley, Calif., Secretary.

WEST VIRGINIA STATE MEDICAL ASSOCIATION, The Greenbrier, White Sulphur Springs, July 23-25. Mr. Charles Lively, P. O. Box 1031, Charleston 24, Executive Secretary.

WYOMING STATE MEDICAL SOCIETY, Henning Hotel, Casper, June 11-13. Dr. Glenn W. Koford, P. O. Box 1252, Cheyenne, Secretary.

FOREIGN

BRITISH MEDICAL ASSOCIATION, Cardiff, S. Wales, July 13-17. Dr. A. MacCrae, B. M. A. House, Tavistock Square, London W.C.1, England, Secretary.

CANADIAN MEDICAL ASSOCIATION, Winnipeg, Manitoba, Canada, June 15-19. Dr. T. C. Routley, 135 St. Clair Avenue W., Toronto 5, Ontario, Canada, General Secretary.

CONGRESS OF INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Chateau Frontenac, Quebec, Canada, October 26-29. Dr. A. William Friend, 515 Nome Ave., Akron 20, Ohio, Chairman, Program Committee.

CONGRESS OF INTERNATIONAL LEAGUE AGAINST RHEUMATISM, Geneva and Zurich, Switzerland, Aug. 24-29. For information write: Dr. W. Tegner, The London Hospital, London E.1, England.

CONGRESS OF THE INTERNATIONAL SOCIETY OF ANGIOLOGY, Lisbon, Portugal, Sept. 18-20. Dr. Henry Haimovici, 105 East 90th St., New York 28, N. Y., U. S. A., Secretary.

CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY, Lisbon, Portugal, Sept. 14-20. Dr. L. Dejardin, 141, rue Belliard, Brussels, Belgium, General Secretary.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 15-19, 1954. Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS OF ACUPUNCTURE, Kolpinghaus, Adolf-Kolping-Strasse 1, Munich, Germany, August 22-25. Dr. G. Bachmann, 29 Lilienstrasse, München 9, Germany, Organizer and Secretary.

INTERNATIONAL CONGRESS OF AUDIOLOGY, Leiden, Netherlands, June 5-6. Dr. H. A. E. ve Dishoeck, Leiden University, Leiden, Netherlands, President.

INTERNATIONAL CONGRESS OF ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY, Boston, Mass., U. S. A., Aug. 18-21. Dr. Robert S. Schwab, Massachusetts General Hospital, Boston 14, Mass., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF THE EUROPEAN SOCIETY OF HAEMATOLOGY, Amsterdam, Holland, Sept. 8-12. Dr. M. C. Verloop, Maliesingle 15, Utrecht, Holland, Secretary.

INTERNATIONAL CONGRESS ON GENETICS, Bellagio, Italy, August 4. Prof. C. Barigozzi, Instituto de Genetica, Universita de Milano, 10 via Celoria, Milan, Italy, Secretary.

INTERNATIONAL CONGRESS OF GYNECOLOGY, Geneva, Switzerland, July 21-26, 1954. Dr. Maurice Fabre, 1, rue Jules-Lefebore, Paris IXe, France, General Secretary.

INTERNATIONAL CONGRESS OF HIPPOCRATIC MEDICINE, Evian, France, Sept. 3-6. Prof. P. Delore, 13 rue Jarente, Lyons, France, Secretary-General.

INTERNATIONAL CONGRESS FOR HISTORY OF SCIENCE, Jerusalem, Israel, August 3-7. Prof. F. S. Bodenheimer, Hebrew University, Jerusalem, Israel, President.

INTERNATIONAL CONGRESS OF HYDROCLIMATISM AND THALASSOTHERAPY, Dubrovnik, Yugoslavia, May 8-16, 1954. Prof. C. Plavsic, Zeleni Venac 1, Belgrade, Yugoslavia, Secretary General.

INTERNATIONAL CONGRESS OF INTERNATIONAL COLLEGE OF SURGEONS, Sao Paulo, Brazil, April 26-May 2, 1954. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U.S.A., Secretary-General.

INTERNATIONAL CONGRESS OF LOGOPEDICS AND PHONIATRICS, Milan and Stresa, Italy, Sept 1-7. Dr. Deso A. Weiss, 115 East 86th St., New York 28, N. Y., U. S. A., General Secretary.

INTERNATIONAL CONGRESS ON MEDICAL LIBRARIANSHIP, London, England, July 20-25. Mr. W. R. LeFanu, % London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, England, Chairman.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS OF MICROBIOLOGY, Rome, Italy, Sept 6-12. For information write: Dr. V. Puntoni, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS ON OBSTETRICS AND GYNECOLOGY, Geneva, Switzerland, July 26-31, 1954. Prof. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF OTORHINOLARYNGOLOGY, Amsterdam, Netherlands, June 8-13. Dr. W. H. Struben, J. J. Viottastraat 1, Amsterdam, Netherlands, Secretary.

INTERNATIONAL CONGRESS OF PAEDIATRICS, Havana, Cuba, Oct. 12-17. Prof. Felix Hurtado, 5a Avenue 124, Miramar, Havana, Cuba, President.

INTERNATIONAL CONGRESS OF RADIOLOGY, Copenhagen, Denmark, July 19-25. Professor Flemming Norgaard, 10 Oster Voldgade, Copenhagen K, Denmark, Secretary General.

INTERNATIONAL CONGRESSES OF TROPICAL MEDICINE AND MALARIA, Istanbul, Turkey, Aug. 28-Sept. 4. Professor Dr. Ihsan Sükrü Aksel, Tunel Meydam, Beyoglu, Istanbul, Turkey, General Secretary.

INTERNATIONAL CONVENTION OF X-RAY TECHNICIANS, Royal York Hotel, Toronto, Canada, June 28-July 2. For information write: Miss Beatrice Hurley, R.T., Registrar, St. Catherine Hospital, East Chicago, Ind., U. S. A.

INTERNATIONAL FERTILITY ASSOCIATION, Henry Hudson Hotel, New York, N. Y., U. S. A., May 25-31. Dr. Abner I. Weisman, 1160 Fifth Avenue, New York 29, N. Y., U. S. A., Associate Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL LEPROSY CONGRESS, Madrid, Spain, Oct. 3-10. Dr. Felix Contreras, Moreto 15, Madrid, Spain, Secretary.

INTERNATIONAL PHYSIOLOGICAL CONGRESS, Montreal, Canada, Aug. 31-Sept. 4. Dr. A. S. V. Burgen, Dept. of Physiology, McGill University, Montreal, Canada, Secretary.

INTERNATIONAL PSYCHO-ANALYTICAL CONGRESS, Bedford College, Regent's Park, London N.W.1, England, July 26-30. Dr. Ruth S. Eissler, 285 Central Park West, New York 24, N. Y., Hon. Secretary.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Basle, Switzerland, Sept. 18-19. For information write: Prof. Dr. F. Georgi, Neurologische Universitats-Poliklinik, Socinstrasse 55, Basle, Switzerland.

INTERNATIONAL VETERINARY CONGRESS, Stockholm, Sweden, Aug. 9-15. Prof. Axel Isaksson, Institute of Veterinary Medicine, Stockholm 50, Sweden, Secretary.

IRISH MEDICAL ASSOCIATION, Waterford, Ireland, July 1-4. Dr. P. J. Delaney, 10, Fitzwilliam Place, Dublin, Ireland, Medical Secretary.

PACIFIC SCIENCE CONGRESS, Quezon City and Manila, Philippines, Nov. 16-28. Dr. Patrocinio Valenzuela, College of Pharmacy, University of the Philippines, Quezon City, Philippines, Secretary-General.

PAN AMERICAN CONGRESS OF THE MEDICAL PRESS, Buenos Aires, Argentine, July 12-16. Secretaria del Congress, 763 Uriburu, Buenos Aires, Argentine.

WORLD CONFERENCE ON MEDICAL EDUCATION, British Medical Association House, Tavistock Square, W.C.1, London, England, Aug. 22-29. Secretariat: World Medical Association, 2 East 103d St., New York 29, N. Y., U. S. A.

WORLD CONGRESS OF THE WORLD CONFEDERATION FOR PHYSICAL THERAPY, London, England, Sept. 7-12. Miss M. J. Neilson, Chartered Society of Physiotherapy, Tavistock House, South, Tavistock Square, London, W.C.1, England, Secretary.

WORLD MEDICAL ASSOCIATION, The Hague, Netherlands, Aug. 31-Sept. 7. Dr. Louis H. Bauer, 2 East 103d St., New York 29, N. Y., Secretary-General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 23-25. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery.

ARKANSAS:* *Regular. Examination.* Little Rock, June 18-19. Sec., Dr. Joe Verser, Harrisburg. *Homeopathic. Examination.* Little Rock, April 6. Sec., Dr. Carl S. Bungart, 105 North 14th St., Ft. Smith. *Eclectic.* Little Rock, June 4-5. Sec., Dr. Frank C. Smith, 2301 Broadway, Little Rock.

CALIFORNIA: San Francisco, June 22-25. Asst. Sec., Mr. Wallace D. Thompson, 1020 N Street, Sacramento 14.

COLORADO:* *Reciprocity.* Denver, July 14. Final date for filing applications is June 12. Exec. Sec., Mrs. B. H. Hudgens, 831 Republic Bldg., Denver. 2.

CONNECTICUT:* *Regular. Examination.* Hartford, July 14-15. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic.* Derby, July 14-15. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: Dover, July 14-16. Sec., Dr. Joseph S. McDaniel, 229 South State St., Dover.

FLORIDA:* Jacksonville, June 28-30. Sec., Dr. Homer Pearson, 701 Dupont Bldg., Miami.

GEORGIA: *Examination.* Atlanta and Augusta, June 9-10. *Reciprocity.* Atlanta, June. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Ex. Sec., Dr. Austin W. Matthis, Agana.

HAWAII: *Examination.* Honolulu, July 13-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: Boise, July 13-15. Exec. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: Chicago, July 7-9. Supt. of Regis., Mr. Fredric B. Selcke, Capitol Bldg., Springfield.

INDIANA: *Examination.* Indianapolis, June 23-25. Ex. Sec., Miss Ruth V. Kirk, 538 K of P Bldg., Indianapolis.

IOWA:* *Examination.* Iowa City, June 15-17. Sec., Dr. M. A. Royal, 506 Fleming Bldg., Des Moines.

KANSAS: Kansas City, June 10-11. Sec., Dr. O. W. Davidson, 864 New Brotherhood Bldg., Kansas City.

KENTUCKY: *Examination.* Louisville, June 8-10. Sec., Dr. Bruce Underwood, 620 South Third St., Louisville 2.

MAINE: *Reciprocity and Examination.* Augusta, July 14-15. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Examination.* Baltimore, June 16-19. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 1.

MASSACHUSETTS: *Examination.* Boston, July 14-17. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston 33.

MICHIGAN: *Examination.* June 10-12, Ann Arbor and Detroit. Sec., Dr. J. Earl McIntyre, 201-4 Hollister Bldg., Lansing.

MINNESOTA:* *Reciprocity.* St. Paul, May 22-23. *Examination.* St. Paul, June 16-18. Sec., Dr. J. F. Du Bois, 230 Lowry Medical Arts Bldg., St. Paul.

MISSISSIPPI: Jackson, June 22-24. Sec., Dr. Felix J. Underwood, Old Capitol Bldg., Jackson 113.

MONTANA: Helena, Oct. 5. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEBRASKA:* *Examination.* Omaha, June 15-17. Director, Mr. Husted K. Watson, Room 1009 State Capitol Bldg., Lincoln 9.

NEW HAMPSHIRE: Concord, Sept. 9. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW JERSEY: Trenton, June 16-19. Sec., Dr. Earl S. Hallinger, 28 West State St., Trenton.

NEW MEXICO:* Oct. 12-13, Santa Fe. Sec., R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 23-26. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany 7.

NORTH CAROLINA: *Examination.* Raleigh, June 22-25. *Reciprocity.* Raleigh, June 23. Sec., Dr. Joseph J. Combs, 716 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 8-11. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Examination.* Columbus, June 15-17. *Reciprocity.* Columbus, July 7. Sec., Dr. H. M. Platter, 21 W. Broad, Columbus 15.

OKLAHOMA:* *Examination.* Oklahoma City, June 10-11. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON:* *Examination.* Portland, July 9-10. *Reciprocity.* Portland, July 24. Exec. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, July. Act. Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* Providence, July 2-3. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 22-24. Sec., Mr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* Rapid City, June 17-18. Exec Sec., Mr. John C. Foster, 300 1st National Bank Bldg., Sioux Falls.

TENNESSEE:* Nashville, June 10-11. Memphis, June 17-18. Sec., Dr. H. W. Qualls, 1635 Exchange Bldg., Memphis.

TEXAS:* Fort Worth, June 22-24. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Ft. Worth 2.

UTAH: *Examination.* Salt Lake City, July. Asst. Dir., Mr. Frank E. Lees, 324 State Capitol Bldg., Salt Lake City.

VERMONT: Burlington, June 15-17. Sec., Dr. F. J. Lawliss, Richford.

VIRGIN ISLANDS: *Examination.* St. Thomas, June 10-11. Sec., Dr. Earle M. Rice, Box 8, St. Thomas.

VIRGINIA: *Examination and Reciprocity.* Richmond, June 17-20. Address: Secretary, Board of Medical Examiners, 631 First St. S.W., Roanoke.

WASHINGTON:* Seattle, July 12-15. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WEST VIRGINIA: Charleston, July 13-15. Sec., Dr. N. H. Dyer, State Office Bldg., Charleston 5.

WISCONSIN:* *Examination.* Milwaukee, July 14-16. Sec., Dr. A. G. Koehler, 46 Washington Blvd., Oshkosh.

WYOMING: *Oral. Reciprocity.* Cheyenne, June 8. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

PUERTO RICO: *Reciprocity.* Santurce, Aug. 4. Sec., Mr. Luis Cueto Coll, Box 9156, Santurce.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

ARIZONA: Tucson, June 16. Sec., Mr. Herbert D. Rhodes, University of Arizona, Tucson.

COLORADO: *Examination.* Denver, Sept. 9-10. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

CONNECTICUT: *Examination.* New Haven, June 13. Exec. Asst., Miss M. G. Reynolds, 110 Whitney Ave., New Haven 10.

DISTRICT OF COLUMBIA: *Examination.* Washington, Oct. 19-20. Sec., Dr. Daniel L. Seckinger, 4130 E. Municipal Bldg., Washington.

IOWA: Des Moines, July 14. Sec., Dr. Ben H. Peterson, Coe College, Cedar Rapids.

NEVADA: Reno, July 7. Sec., Mr. Frank Richardson, University of Nevada, Reno.

NEW MEXICO: Santa Fe, June 21. Sec., Mrs. Marguerite Cantrell, P. O. Box 1592, Santa Fe.

TENNESSEE: Memphis, July 2-3. Sec., Dr. O. W. Hyman, 874 Union Ave., Memphis.

TEXAS: *Examination.* Austin, October. Chief Clerk, Mrs. Sandra Allen, 407 Perry-Brooks Bldg., Austin.

WASHINGTON: *Examination.* Seattle, July 8-9. Sec., Department of Licenses, Mr. Edward C. Dohm, Olympia.

WISCONSIN: *Examination.* Milwaukee, June 13. Final date for filing application is June 6. Madison, Sept. 19. Final date for filing application is Sept. 11. Sec., Dr. W. H. Barber, 621 Ransom St., Ripon.

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* Basic Science Certificate required.

DEATHS

Luce, Dean Sherwood ⊕ Canton, Mass.; born in Holliston, Mass., March 13, 1876; Harvard Medical School, Boston, 1904; after interning at the Long Island Hospital in New York, began to practice in Canton in 1905; past president of the Norfolk District Medical Society; a councilor of the Massachusetts Medical Society and a member of its committee on public relations; captain in the medical corps of the U. S. Army during World War I and a member of the Selective Service Board of his community in World War II; a trustee of the Canton Public Library, member of the Canton Board of Health, and the school physician of that city for many years; in 1950 the American Medical Association awarded him its gold medal "for exceptional service by a general practitioner"; member of the editorial board and formerly editor-in-chief of the *Norfolk Medical News;* affiliated with the Milton (Mass.) Hospital and the Norwood Hospital, where he died April 9, aged 77, of a heart attack.

Weintrob, Morris ⊕ Brooklyn; born in London, England, July 29, 1900; University and Bellevue Hospital Medical College, New York, 1925; fellow and member of the credentials committee of the International College of Surgeons; president-elect of the Kings County Surgical Society; served as president of the Kings County Physicians Guild and editor of its publication; member of the Association of Military Surgeons of the United States; in charge of surgery for the Navy on Okinawa during World War II and held the reserve rank of commander; senior censor of the Kings County Medical Society and chairman of its committee on cults; on the staffs of the Adelphi Hospital and the Jewish Sanitarium and Hospital for Chronic Diseases; also a poet; wrote "Moments of Reflection" and others; died April 7, aged 52, of heart disease.

Colver, Benton Noble ⊕ Glendale, Calif.; born in Wellington, Ohio, in 1880; American Medical Missionary College, Battle Creek, Mich., and Chicago, 1904; University of Pennsylvania School of Medicine, Philadelphia, 1911; professor of otolaryngology at the College of Medical Evangelists, Loma Linda and Los Angeles; member of the American Academy of Ophthalmology and Otolaryngology, American Laryngological, Rhinological and Otological Society, and the Pacific Coast Oto-Ophthalmological Society; specialist certified by the American Board of Otolaryngology; fellow of the American College of Surgeons; on the staffs of White Memorial Hospital in Los Angeles and the Glendale Sanitarium and Hospital; died March 14, aged 72.

Maytum, Charles Koran ⊕ Rochester, Minn.; born in Alexandria, S. D., Dec. 20, 1894; State University of Iowa College of Medicine, Iowa City, 1919; specialist certified by the American Board of Internal Medicine; in 1927 became instructor in medicine, Mayo Foundation, Graduate School, University of Minnesota, where in 1934 he was assistant professor, in 1945 associate professor, and later senior consultant, division of medicine; served during World War II; fellow of the American College of Physicians; member of the American Academy of Allergy, the Alumni Association of the Mayo Foundation, Phi Rho Sigma, and Sigma Xi; died April 10, aged 58, of coronary sclerosis.

Almour, Ralph, New York City; born in Mantorville, Minn., June 21, 1897; Columbia University College of Physicians and Surgeons, New York, 1919; professor of otolaryngology at the New York Polyclinic Medical School and Hospital; member of the American Academy of Ophthalmology and Otolaryngology; during World War II a lieutenant colonel in the Army in the European theater of operations; specialist certified by the American Board of Otolaryngology; formerly affiliated with Beth Israel and Sydenham hospitals; attending otolaryngologist, New York Polyclinic Medical School and Hospital, where he died March 27, aged 55, of hypertension and cirrhosis of the liver.

Burke, John Edward ⊕ Schenectady, N. Y.; born in Saratoga Springs, N. Y., Feb. 15, 1883; Albany (N. Y.) Medical College, 1915; past president of the Schenectady County Medical Society; an Associate Fellow of the American Medical Association; fellow of the American Public Health Association; member of the American Association of School Physicians; served during World War I; for many years chief school physician, chief medical supervisor, and assistant superintendent in charge of health and physical education; on the staff of the Ellis Hospital from 1924 to 1943; died Feb. 11, aged 69, of coronary occlusion.

Davis, James Haywood, Fort Worth, Texas;. University of Alabama School of Medicine, Mobile, 1912; at one time practiced in Jasper, Ala., and was the first president of the Walker County Medical Society; in 1935 was vice-president of the Tarrant County Medical Society; served during World Wars I and II; returned in 1948 to Fort Worth and became medical officer in charge of the outpatient clinic of the Veterans Administration and held a similar position in Dallas; died in the VA Hospital in McKinney, recently, aged 67, of chronic glomerulonephritis.

Skeer, Jacob ⊕ Brooklyn; born in Boston in 1893; New York Homeopathic Medical College and Hospital, New York, 1918; assistant clinical professor of dermatology and syphilology at New York University College of Medicine; member of the American Academy of Dermatology and Syphilology; specialist certified by the American Board of Dermatology and Syphilology; past president of the Brooklyn Dermatological Society; served during World War I; affiliated with Beth-El, Cumberland, Maimonides, and Jewish hospitals; died March 11, aged 60, of hypertension.

Richardson, Wyman, Newton, Mass.; Harvard Medical School, Boston, 1923; certified by the National Board of Medical Examiners; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served in France during World War I; formerly on the faculty of his alma mater and on the staff of the Massachusetts General Hospital and Palmer Memorial Hospital in Boston and Sturdy Memorial Hospital in Attleboro; died in Baker Memorial Hospital in Boston Feb. 1, aged 56, of thrombosis of the basilar artery.

Ames, John Lincoln ⊕ Larchmont, N. Y.; Harvard Medical School, Boston, 1892; member of the Massachusetts Medical Society; specialist certified by the American Board of Internal Medicine; professor of theory and practice of medicine emeritus at Tufts College Medical School in Boston; served as consulting physician at the Boston City Hospital; died March 20, aged 90.

Amoroso, Peter Francis ⊕ New York City; Fordham University School of Medicine, New York, 1914; first deputy commissioner, department of corrections; affiliated with Columbus Hospital, where he died recently, aged 61, of diabetic acidosis, arteriosclerotic heart disease, and pneumonia.

Anderson, Leonard R. ⊕ Dallas, Texas; University of Louisville (Ky.) Medical Department, 1891; died March 15, aged 87.

Avery, Lewis Gorton, Venice, Calif.; College of Physicians and Surgeons, Los Angeles, 1913; formerly on the faculty of his alma mater; served during World War I; died Feb. 28, aged 65, of coronary thrombosis.

Bartron, Harry Jacobs ⊕ Watertown, S. D.; University of Minnesota College of Medicine and Surgery, 1906; past president of the state board of health; fellow of the International College of Surgeons and the American College of Surgeons;

⊕ Indicates Member of the American Medical Association.

on the honorary staff of St. Ann Hospital; surgeon in charge, Bartron Hospital, of which he was the founder; died March 15, aged 71, of cerebral hemorrhage and arteriosclerosis.

Bates, Grace Margaret, New York City; Columbia University College of Physicians and Surgeons, New York, 1928; died in the House of Holy Comforter Jan. 24, aged 70, of Parkinson's disease.

Boyd, William Ballantine Jr. ⊕ Franklin, N. J.; Columbia University College of Physicians and Surgeons, New York, 1938; on the staff of the Franklin Hospital; died March 24, aged 41.

Crane, Bernard ⊕ Atlantic City, N. J.; University of Michigan Medical School, Ann Arbor, 1923; served during World War II; died March 21, aged 55, of acute coronary thrombosis.

Du Bois, Francis Elbert ⊕ Winter Park, Fla.; Columbia University College of Physicians and Surgeons, New York, 1903; member of the Medical Society of the State of New York and the American Urological Association of which he was past president; formerly practiced in New York, where he was on the staff of St. Luke's Hospital; died Jan. 31, aged 77, of postcerebral hemorrhage syndrome, hypertension, arteriosclerosis, and bronchopneumonia.

Ellington, Walter Edward ⊕ Paragould, Ark.; Memphis (Tenn.) Hospital Medical College, 1913; for many years county health officer; died March 10, aged 69, of coronary occlusion.

Fagan, Albert L. ⊕ Herkimer, N. Y.; Syracuse University College of Medicine, 1908; health officer; affiliated with Herkimer Memorial Hospital, where he died March 26, aged 67, of cardiovascular disease.

Falk, Emanuel L., Brooklyn; Long Island College Hospital, Brooklyn, 1911; specialist certified by the American Board of Ophthalmology and the American Board of Otolaryngology; affiliated with Manhattan Eye, Ear and Throat Hospital in New York and Maimonides Hospital; died in the Jewish Sanitarium and Hospital for Chronic Diseases March 20, aged 68, of cancer of the bone.

Halstead, France W. ⊕ Freeport, Ohio; Illinois Medical College, Chicago, 1904; died in the Presbyterian Hospital, Pittsburgh, recently, aged 81.

Hoffman, Fred St. John ⊕ Buffalo; Niagara University Medical Department, Buffalo, 1894; formerly on the faculty of his alma mater; served during World War I; affiliated with Millard Fillmore Hospital; died March 9, aged 79, of cerebral arteriosclerosis and cerebral embolism.

Hoffman, Philip Foster ⊕ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1900; an Associate Fellow of the American Medical Association; member of the Medical Society of the State of New York; died in the Hahnemann Hospital Feb. 2, aged 75, of arteriosclerotic heart disease.

Kahn, Karl Heinrich ⊕ Chicago; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, Germany, 1903; died in the Fairview Sanitarium March 25, aged 73, of acute coronary occlusion, diabetes mellitus, and cerebral arteriosclerosis.

Kerr, James Edwin ⊕ Winston-Salem, N. C.; University of Maryland School of Medicine, Baltimore, 1897; served during World War I; died in the City Hospital Feb. 18, aged 76, of cerebrovascular thrombosis and arteriosclerosis.

Loffler, Gilbert Dennis, Lincoln, Neb.; Barnes Medical College, St. Louis, 1901; died Feb. 3, aged 84, of arteriosclerosis and emphysema.

Miller, Allen Jay ⊕ Chicago; Medical College of Ohio, Cincinnati, 1894; an Associate Fellow of the American Medical Association; president of the Southtown Hospital, where he died Feb. 23, aged 83, of arteriosclerotic heart disease and diabetes mellitus.

Rhodes, William Seymour, Columbus, Ohio; Starling Medical College, Columbus, 1898; affiliated with Grant Hospital, St. Ann's Maternity Hospital, and St. Anthony's Hospital; died Jan. 16, aged 75, of cerebral hemorrhage.

Ritzman, Allen Zachariah ⊕ Harrisburg, Pa.; Medico-Chirurgical College of Philadelphia, 1909; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, Radiological Society of North America, and the American College of Radiology; on the staffs of the Harrisburg Polyclinic and Harrisburg hospitals; died Feb. 6, aged 67, of coronary thrombosis.

Schneider, Frank Carl Emil, Peru, Ill.; Homeopathic Medical College of Missouri, St. Louis, 1909; died Feb. 27, aged 78, of acute coronary occlusion.

Schrift, Joseph, New York City; University and Bellevue Hospital Medical College, New York, 1903; served on the staff of the Lenox Hill Hospital; died Jan. 31, aged 72, of carcinoma.

Shiffman, Harry ⊕ New York City; New York University and Bellevue Hospital Medical College, New York, 1919; died March 2, aged 55, of coronary occlusion.

Simmons, Clifford F. ⊕ Philadelphia; Medico-Chirurgical College of Philadelphia, 1903; died March 9, aged 73.

Smith, James David, Franklin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1890; University of Nashville Medical Department, 1890; died Feb. 5, aged 86.

Smith, Reuben Milton ⊕ St. Louis; Washington University School of Medicine, St. Louis, 1924; died in St. Anthony's Hospital Feb. 7, aged 51.

Steele, George Louis ⊕ Springfield, Mass.; University of Vermont College of Medicine, Burlington, 1914; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; served during World War I; trustee of the Health Department Hospital; on the staffs of the Springfield and Wesson Memorial hospitals; consulting physician at the Wing Memorial Hospital in Palmer and the Mary Lane Hospital in Ware; died Feb. 16, aged 61, of congestive heart failure and coronary disease.

Turner, James William ⊕ Sterling, Neb.; Eclectic Medical Institute, Cincinnati, 1893; died March 6, aged 83, of a heart attack.

Turner, Thomas J., Monette, Ark.; Barnes Medical College, St. Louis, 1900; died Feb. 18, aged 88, of influenza, pneumonia, and arteriosclerosis.

Wadsworth, Emory M. ⊕ Rhinebeck, N. Y.; University of Buffalo School of Medicine, 1898; Associate Fellow of the American Medical Association; formerly practiced in Brooklyn, where he was associated for many years with St. John's Episcopal Hospital; school physician in Rhinebeck; died April 1, aged 78, of coronary disease.

Watt, Charles Channing Jr. ⊕ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1909; served during World War I; on the consulting staff of the Germantown Dispensary and Hospital, where he died March 18, aged 66, of carcinoma of the pancreas.

White, Mary Harriet, Cleveland Heights, Ohio; Cleveland Homeopathic Medical College, 1898; for many years on the staff of the Huron Road Hospital in East Cleveland, where she died April 3, aged 93.

Wilson, William Hansford ⊕ Danville, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; served as health officer; on the staff of St. Elizabeth Hospital, where he died March 11, aged 68, of intestinal obstruction.

Wolf, Louis Harry, Chicago; Northwestern University Medical School, Chicago, 1909; died in Columbus Hospital April 12, aged 66, of uremia and chronic glomerulonephritis.

Wright, Thomas Rogers ⊕ Marlin, Texas; University of Texas School of Medicine, Galveston, 1929; served during World War II; died March 13, aged 48.

Xavier, Frank Kuczewski ⊕ Chicago; University of Illinois College of Medicine, Chicago, 1935; served during World War II; died April 17, aged 54, of cerebral hemorrhage.

FOREIGN LETTERS

BRAZIL

Anastomosis of Transverse Colon to Rectum or Anus.—Drs. Edison Oliveira and Werneck Lima of the Escola Paulista de Medicina in São Paulo pointed out in the *Revista Brasileira de Gastroenterologia* recently the convenience and, many times, the necessity of anastomosis of the transverse colon to the rectum or the anus. They listed the following indications for the operation: (*a*) traumatic lesions of the left half of the colon; (*b*) traumatic arterial lesions in the left side of the colon; (*c*) thromboembolism in the inferior mesenteric artery; (*d*) ulcerative colitis of the left half of the colon; (*e*) diverticulosis of the left half of the colon; (*f*) polyposis of the left half of the colon; (*g*) lymphogranuloma of the rectum; (*h*) megacolon; and (*i*) malignant tumors of the left half of the colon.

In malignant disease of the descending colon, the surgical procedure is adapted to the location of the lesion. In cancer of the rectum below the plica transversalis of Kohlrausch, Oliveira and Lima advise the Miles abdominoperineal resection, with high ligature of the inferior mesenteric vessels and colostomy in the transverse colon or the most proximal part of the descending colon. When cancer of the rectum or of the rectosigmoid is above the plica transversalis, they advise anterior resection, with high ligature of the inferior mesenteric vessels, or anastomosis of the transverse colon to the anus. In cancer of the sigmoid and of the descending colon, they advise anterior resection, with high ligature of the inferior mesenteric artery.

Nine of their own cases were reported by the authors. In some of these cases the transverse colon was anastomosed to the anus, and in others the transverse colon was anastomosed to a small segment of the rectum.

Fruit of Pine Tree Used as Food.—There is in Brazil a tree, the fruit of which is widely used for nutritional purposes. The tree is a conifer (Pinus), the Araucaria brasiliana (Lamb). Its fruit (in Portuguese the *pinhão*) has many useful properties. Some research with the fruit has been done by Drs. Azor Cruz, Rubens Siqueira, and Emilia Pechnik at the University of Parana in Curitiba. Their results were reported to the National Academy of Medicine as a contribution to the knowledge of Brazilian native foods. The conclusions drawn by the authors are as follows: 1. The fruit may be considered a good source of carbohydrates (group C vegetables of Argentine classification.) 2. It is a poor source of proteins, thus leading to modification of the until now generally accepted belief that the protein value of this food is high. 3. The pine tree fruit contains a good amount of nicotinic acid (2 mg. per 100 cc.) and little thiamine. 4. The calcium and phosphorus content is relatively low. 5. Cooked or raw, the fruit prevents vitamin E deficiency in test animals, which proves that it contains this vitamin.

Functional Disorders of the Biliary Tract.—For his admission as a member of the Sociedade de Medicina e Cirurgia de São Paulo, the higher medical society of São Paulo, Dr. Waldyr da Silva Prado prepared a paper on functional disorders of the biliary vessels. He emphasized that many patients operated on for organic lesions of the biliary tract are not benefited by removal of the lesions. There are patients with symptoms clearly referable to the biliary tract in whom examination does not reveal a reasonable organic basis for the symptomatology.

Dr. Waldyr da Silva Prado reviewed the anatomic and physiological basis for disorders of the extrahepatic biliary vessels, emphasizing the importance of the sphincters and their tonus as well as of the pressure within the biliary vessels. Recent progress in biliary surgery and especially the manometry has provided physiological data that explain many such syndromes. In his work, Dr. Waldyr da Silva Prado studied hypotonicity of the sphincter of Oddi and concluded that functional disorders can cause a reasonably characteristic clinical syndrome. Such functional disorders may have, over a long period, a serious outcome as a result of effects on the liver and pancreas. Such involvement may eventually give rise to symptoms that dominate the clinical picture and for which there is not always efficient treatment.

Thus, as a result of foreign teaching, mainly from the French, and his own observations, Dr. Waldyr da Silva Prado suggested that hypotonicity of the sphincter of Oddi should be treated surgically, since to date medical treatment has not been efficient. The surgical treatment indicated is right splanchnicectomy, which results in an increase in the tonus of the sphincters of the biliary system. Such an operation ought to be undertaken early in the disease, before hepatic and pancreatic complications have been established.

DENMARK

Mental Hygiene Census.—What do mothers of neurotic children know about the prevention of neuroses among them? This question occurred to Dr. Steen Warthoe, of the Martinsvej Children's Hospital, as he reflected on the educational facilities available for the children admitted for nervous ailments to hospital in the period 1949-1951. To answer this question he promoted a census among the mothers of these children, addressing to each mother a questionnaire, which may thus be summarized: As your child has been admitted to hospital for a nervous ailment, and as we have started an investigation of such ailments in children, would you kindly tell us whether you or your husband had received any information about the psychology or educational problems of children before your child was admitted to this hospital? If so, did you get this information from newspapers and other printed matter, from radio talks, or from other lectures? Did you get such information from physicians, midwives, nurses, schoolteachers, or other sources?

Among the 163 mothers thus questioned, 88 answered in full. Of the remaining 75, 54 were successfully contacted and interviewed at home. Lastly, 54 women who had been admitted to hospital during the period 1951-1952 for minor mental ailments, and who had children under the age of 10, were interviewed by Dr. Warthoe himself. The data collected from these three groups of mothers indicated that the mothers had learned more from the radio and their own reading than from physicians, nurses, midwives, schoolteachers, and others. In *Ugeskrift for laeger* for April 9, 1953, Dr. Warthoe notes the source of the information for 200 mothers. The radio headed the list, with 103 persons using it for this purpose (51.5%). Newspapers followed with 85 (42.5%). Physicians were much lower on the list, with 37 (18.5%). School psychologists were still lower, with 7 (3.5%), and there was only one mother (0.5%) whose knowledge of mental hygiene came from a midwife. It is evident that most, if not always the best, information given to mothers of nervous children comes from the radio and the printed word rather than from the physicians, nurses, and schoolteachers, who are thought to be specially concerned with this problem.

BCG Vaccination in the Island of Bornholm.—An antituberculosis campaign has been carried on effectively for a long time in the Danish island of Bornholm and sets the pace in this field and in BCG vaccination. The latest report on it has been given in a doctorate thesis by Dr. Erling Nielsen, who has undertaken a comprehensive study of this problem over many years. Though he is fully aware of the fallacies inherent in comparisons of tuberculosis morbidity and mortality between BCG-vaccinated persons and the nonvaccinated, and though he gives the data with all due reserve, he argues that

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The items in these letters are contributed by regular correspondents in the various foreign countries.

statistically significant differences can be claimed. Compared with 3,248 BCG-vaccinated persons were 10,438 tuberculin-negative persons serving as controls. The ratio of the tuberculosis mortality of BCG-vaccinated persons to non-BCG-vaccinated persons was 1 to 4.2; that of the total tuberculosis morbidity was 1 to 2.6; of primary tuberculosis 1 to 7; and of pleurisy 1 to 1.7.

Dr. Nielsen is in favor of BCG vaccination on a wide scale, in line with other prophylactic vaccinations, and, although he considers the newborn infant the ideal subject for BCG vaccination, he admits that for practical reasons it may be necessary to vaccinate some other time during the first year of life. He prefers Wallgren's intracutaneous vaccination to the percutaneous methods and has found that revaccination has been undertaken on a considerable scale on the island. About 80% of the persons vaccinated in the period 1936-1941 were still Mantoux-positive five to six years after such vaccination. A considerably higher percentage of positive reactors (92 to 96%) was found among persons who had been vaccinated during the period 1942-1945, and this difference between the two periods was probably due to the fact that the vaccine employed in the latter period was more potent; the complication rate was higher after the last than after the first period, probably for the same reason. While no relationship could be established between the extent of the local reaction and the age of the person vaccinated, the percentage of positive reactors was considerably higher for the period 1941-1945 (98%) than for the period 1936-1941 (between 90 and 98%).

Methantheline Bromide in Treatment of Gastric Ulcer.—Manufacturers of methantheline bromide (Banthine) in the United States have supplied the drug for extensive trial in several Danish hospitals. From the Aarhus County Hospital and the Copenhagen City Hospital comes a report by Dr. Poul Bechgaard and his colleagues on 34 patients, 29 of whom suffered from duodenal ulcer. Their symptoms had lasted at least two years, and all of them had already had at least one course of therapy without becoming symptom-free. They were, in fact, candidates for operative treatment. With a dose of 50 mg. four times daily, freedom from pain was soon achieved, notably hunger pain. After three months two-thirds of these patients were still free from pain and one-third showed radiological healing of the ulcers. But after a year only one-third were still free from pain and only one-fifth showed radiological healing of the ulcers. During the same year 10 of the 34 were operated on. These results have led to the conclusion that methantheline bromide is no more than a useful supplement to the standard medical treatment of gastric ulcer and should not be given for more than three months at a time.

In the same number of *Ugeskrift for laeger* for April 9, 1953, in which these findings are published, Dr. H. O. Bang and his colleagues report on a carefully controlled test of methantheline bromide at the Copenhagen City Hospital. Of a total of 134 patients suffering from peptic ulcer, 68 were given 50 mg. of the drug three times a day, while 66 served as controls, being given an inert placebo made up so as to be indistinguishable from the methantheline bromide tablets. The influence of the force of suggestion was demonstrated by the fact that nearly all the recipients of the placebo complained of dryness of the mouth when questioned about this possible sequel to methantheline bromide treatment. The allotment of methantheline bromide and placebo tablets was effected by drawing lots by persons not in contact with the patients. Both groups of patients were treated for the first 10 days in hospital, where records were taken of pain, vomiting, and any side-effects. After discharge the patients were instructed to keep to the same diet and dosage of tablets. The patients were reexamined two weeks after discharge and again some 10 weeks after the treatment was started. Clinical improvement was recorded in 65% of the methantheline bromide group and in 56% of the placebo group. The corresponding percentages showing radiological improvement were 23% and 14%, respectively. The differences in favor of the methantheline bromide group were not considered important enough to justify rating the drug as a remedy sufficient in itself. But with its capacity to reduce pain it may prove an excellent adjunct to ordinary dietetic treatment.

ISRAEL

Problem of Trachoma.—One of Israel's problems has always been that of trachoma. Owing to the activities of the Hadassah Anti-Trachoma Service, which started its activities in 1919, the disease had been practically eradicated by the end of 1947, especially in the European sector of the population, and the few cases that remained were found in particularly backward Oriental communities. With the mass immigration of Oriental Jews from North Africa, Southern Arabia, Persia, and Iraq in the last three to four years, the disease is now reappearing. It is the most prevalent eye disease among new immigrants, and there are reported to be over 63,000 active cases.

Incidence of Trachoma According to Country of Origin

Country of Origin	No. of Immigrants	No. of Cases	Percentage
Yemen	42,174	33,671	79.83
North Africa	79,612	19,638	24.80
Iraq	115,280	15,210	13.19
Europe	377,805	4,529	1.20

According to the report of the health service in 1952, the main reservoirs of infection are mothers and children, and the highest proportion of cases are found in school children. The fact that the majority of persons affected by trachoma live in the rural new immigrant settlements intensifies the difficulty of treating such a large number of cases. Efforts to cope with this vast problem have been made by existing medical institutions in the country, especially by Hadassah and Kupat Holim (Workers Sick Fund). However, owing to the magnitude of the problem created by the arrival of a large number of immigrants in so short a period, it became clear that only with the assistance of the government could the fight against trachoma be dealt with successfully. To this end a pilot experiment was started by the Ministry of Health in the Northwestern part of the country around Haifa, at the end of 1950.

The plan of the experiment was to detect all existing cases of trachoma in the schools situated in the numerous Arab and Jewish settlements, to treat them, and, in cases of reinfection after cure, to detect and treat contacts. Since there were not enough physicians and nurses to allocate a separate diagnostic and treatment unit to each settlement, two ophthalmologists were appointed to carry out a survey of cases in the assigned area, establish the diagnosis, and determine the line of treatment. Treatment would be conducted, as far as possible, on the lines laid down by the World Health Organization. The ophthalmologists were to work in close cooperation with the ophthalmic department of the government hospital at Haifa, under the supervision of the chief ophthalmologist, Dr. Michelson. The nursing problem was overcome, to some extent, by choosing a nurse or lay person in each settlement who was trained by the ophthalmologist to carry out treatment. The district health office was responsible for the over-all organization and administration of the program, including the supply of transport. The experiment was not entirely a success, partly because transportation for the personnel was lacking and partly because it was found that without adequate health education on the part of the staff of the settlements and the medical personnel, the majority of patients would not appear regularly for treatment. In June, 1952, UNICEF generously provided transportation for public health nurses and other health personnel working in rural areas, and therefore plans have been drawn up based on the Haifa area experiment, dividing the country into areas, with the aims of gradually extending the campaign throughout the country.

Trachoma is a disease of poor social conditions and is practically eliminated when social and sanitary conditions improve. It is felt, however, that in the present state of the country it is not sufficient to wait for this general improvement and that the matter is urgent enough to warrant a definite curative campaign.

ITALY

Inheritance of Diabetes Mellitus.—Joslin has said there are in the United States 2 million persons with diabetes mellitus. According to Martin, in Switzerland 2 persons out of every 1,000 have diabetes, in Sweden 2.4, and in Italy, claimed Travia, 2.2. According to Dublin and Marks (*Diabetes* **1**:205 [May-June] 1952), the highest mortality due to diabetes is in the United States, followed by Canada; last in the statistical scale are Austria and New Zealand. In Europe the highest mortality is in Denmark and Belgium. It was said that diabetes is caused by a decreased production of insulin by the beta cells of the pancreas or by a production that has become insufficient because of an increased demand of the organism. This increased need could be caused by a high carbohydrate diet or by a life of anxiety and emotional disturbances. It follows that a disposition to diabetes, which in other times would have remained hidden, is today brought out in the open because of a worried mode of life and, in some quarters, inadequate nutrition. In addition, there is the factor of a greater average life expectancy and therefore the tendency to a late diabetes, namely, a diabetes that appears when the person is about 60 years of age.

Today the number of persons with diabetes who marry and have children is constantly increasing. Three Italian workers, A. Iannaccone, A. D'Agostino, and M. Sinisclaco, with aid from the Rockefeller Center of New York (through the University of Naples Institute of Genetics directed by Prof. G. Montalenti), made a study of 490 families of diabetics. Their report was read at the International Congress of Diabetes in Leyden, Netherlands, some months ago. According to an editorial in *Il progresso medico* (**9**:17 [Jan. 15] 1953) the results of this report are confirmed by two groups of research workers abroad who were not aware of the study of the Italian workers. The first group is represented by Steinberg and Wilder from the Mayo Clinic (*Am. J. Human Genet.* **4**:113 [June] 1952), and the second by the Canadians Thompson and Watson (*Diabetes* **1**:268 [July-Aug.] 1952). These authors agree with the Italian authors that the diabetic gene is not dominant, but is a recessive autosome, therefore localized in a nonsexual chromosome. If the genopathic condition predisposing to diabetes is indicated by "d" and the correlated normal genetic condition is indicated by "D," the Italian workers indicated the persons who have diabetes or are predisposed to it by dd and the persons who are not predisposed to it by DD or Dd. The result is that all the offspring of two diabetics (dd x dd) will have a predisposition for the disease, and this constitutes a reason for preventing the marriage between two diabetics. On the other hand, the marriage of a diabetic (dd) with a nondiabetic person will give varying results, according to whether the healthy person is homozygous (DD) or heterozygous (Dd). Half of the children from the dd x DD crossing will be predisposed to diabetes (dd). Diabetic children can also be born from the marriage of persons who are nondiabetic but have the gene d (Dd x Dd). Because up-to-date it is still impossible to know whether a nondiabetic person is really DD or Dd, it is advisable that diabetics marry persons who are nondiabetic and who are the offspring of marriages between nondiabetics.

Another point on which there is complete agreement between the Italian and the foreign authors is the much discussed existence of secondary genes not linked to the sex gene. It is well known that diabetes mellitus is a varied disease in regard to the gravity of its symptoms and the age in which it appears. It was thought that this rested on the existence of secondary (modifying) genes able to influence the principal gene and accelerating, slowing up, or mitigating its manifestation. In 1945 Penrose and Watson supposed that these modifying genes were situated in the sexual chromosomes. In fact, there were cases, such as that described by Barker and co-workers in 1951, in which the gene of diabetes behaved as if it were linked to the sex: in a family with six children only the three boys had diabetes; however, these cases of sexual linkage are very rare. The linkages of the gene of diabetes to the modifying genes and the localization of the latter in the sexual chromosomes seemed more probable. But this supposition is also denied by the Italian authors in their work, and a confirmation was brought about by the works of Penrose and Watson. Also an undoubted linkage between the gene of diabetes and that of "nontaster" of phenylthiocarbamide is not accepted by the Italian workers. It is known that Terry and Segall ascertained that they found a greater number of nontasters of phenylthiocarbamide among diabetics than among nondiabetics. This aroused the hope of a linkage between the two genes—the persons who cannot detect (nontasters) the bitter taste of this substance are homozygous for only a single recessive gene—and therefore the possibility of discovering in a nondiabetic person whether he is a DD or a Dd on the basis of his being able to detect the bitter taste of phenylthiocarbamide. The Italian authors do not assert the existence of this linkage, which was denied by others also. They think that the concomitance of two characters proves the existence of a "polypheny" rather than a linkage. It is like saying that one gene is capable of controlling two or more characters; for example, the concomitance of blue eyes in diabetic offspring does not mean that there is a linkage between the gene of diabetes and the gene of blue eyes; however, one gene alone can influence the diabetic character and the blue eyes character; therefore, the absence of blue eyes should not make one presume that the person does not have the gene of diabetes. The same applies to the person's ability to detect the bitter taste of phenylthiocarbamide. Meanwhile, other Italian workers are exploring linkage between the blood group and the gene of diabetes. These studies are still in progress.

LONDON

General Practice in the National Health Service.—The fourth report to the Minister of Health by the Medical Practices Committee for England and Wales deals predominantly with the 18 months ended Dec. 31, 1952, but it also reviews some of the developments since the inauguration of the National Health Service in July, 1948. At that time the total number of physicians in England and Wales was 16,864 and the number of registered patients approximately 41,500,000, giving an average of 2,466 patients per physician. The corresponding numbers in July, 1952, were: 17,383 physicians, 42,250,000 patients, and an average of 2,430 patients per physician. In 1948 there were wide variations in different parts of the country. For instance, in Radnorshire, Wales, the average number of patients per physician was 1,120, while in part of Glamorganshire, Wales, it was over 8,000. In 1952 the averages for these two areas were 1,320 and 2,832.

This evening-out in the distribution of physicians has occurred throughout the entire country. Thus, in areas where the average lists were high, in July, 1948, there were 6,648 physicians with average lists of 3,163, but by January, 1952, there were 7,397 physicians (i. e., an increase of 10%) with average lists of 2,869. The same tendency has been in action in reverse in areas in which originally average lists were low; in these areas in 1948 there were 1,176 physicians with average lists of 1,648, and by 1952 there were only 1,062 physicians (a decrease of approximately 10%) with average lists of 2,010. Most of the 1,560 assistants practicing in the service are employed in the areas of high average lists. Bournemouth, a fashionable summer resort on the southern coast, and also a favorite resort for men of affluence to retire to, provides an interesting example of the way things are going; in 1948 it had 97 physicians with average lists of 1,237, but by 1952 there were only 72 physicians with average lists of 1,827. In the opinion of the committee, "it appears doubtful whether the number of doctors practicing in these areas will or should be much further reduced. A number of these practitioners have held during their more active years busy practices in other areas and have preferred to take smaller practices later in life rather than carry on work that had become too heavy for them or to retire completely. It is right that they should still be permitted to do this."

The report also contains the revised classification of England and Wales, based on the distribution of practitioners. There are three classes of areas. Designated areas are areas that

are considered to be "under-doctored," and in which, therefore, admission to the local medical list will be automatic. Doubtful or intermediate areas are those in which admission to the list to practice will be decided in the light of the medical manpower and other circumstances prevailing at the time of application. Automatic acceptance cannot be assumed. Restricted areas are areas in which the committee has decided that the number of physicians practicing is adequate. Normally applications to start new practices will not be granted. In cases in which an existing practice is concerned regard will be had to all the circumstances of the case.

During the 18 months ended Dec. 31, 1952, 300 applications were made by physicians who had themselves chosen a place in which to begin a new practice; 290 of these were granted. The number of admissions to the list of physicians as partners in established practices was 781. Of these, 44 were replacements for partners who were withdrawing from the list, and 737 were additional partners. In 344 instances the new partner had served as assistant in the practice before his admission to partnership. The number of vacancies advertised was 208, of which 28 were for the purpose of beginning new practices from premises situated usually in new housing estates. The remainder were for vacancies in established practices following the death or resignation of single-handed practitioners. There were 72 appeals to the Minister of Health from the selection by the Medical Practices Committee to fill these vacancies, of which four were successful. It is stated that the average age of candidates selected for advertised vacancies has fallen from 38 to 36. The proportion of physicians above and below 40 years of age applying for advertised vacancies remained fairly constant. In this connection the committee comments: "We have been glad to note a tendency on the part of some Executive Councils to give consideration to older applicants for vacancies and particularly to those who have retired from other forms of medical practice at a comparatively early age. In the main, however, the extreme difficulty remains for this class of applicant when attempting to make a belated entry into general practice."

The number of full-time assistants, other than trainees, employed by physicians in general practice fell from 1,724 in 1951 to 1,566 in November, 1952. There is an increasing tendency for assistants in the larger practices to be taken into partnership. It is considered that "there is little evidence to support the contention that the advent of the National Health Service in 1948 produced a very large increase in the numbers of permanent assistants employed in general practice." There are no reliable figures for the period prior to 1948, but there are grounds for believing that in 1947-1948 there were approximately 2,100 in the United Kingdom and Northern Ireland.

SWEDEN

Census of Paraplegics.—Dr. Olle Höök, of the neurological department of the Serafimer Hospital in Stockholm, recently visited England to study the paraplegic centers started during the war and now dealing chiefly with civilian patients. He spent sometime at the Stoke Mandeville Hospital, in which 120 beds are devoted to paraplegics. On his return to Sweden he took an active part in a paraplegic census carried out in July, 1952, by means of a questionnaire addressed to all the medical, surgical, neurological, orthopedic, and pediatric hospitals in the country. The aim of the census was to discover the number of newly afflicted paraplegics who were admitted to hospital during the first half of 1952. Excluded from this census were cases of paraplegia beginning at birth or in early infancy, as well as old cases of paraplegia treated earlier in hospital. It was hoped that this census would give a roughly accurate estimate of the number of new cases of paraplegia that occur every year in Sweden and that hitherto have been scattered in various hospitals throughout the country.

The response to this census was most satisfactory, the 284 physicians contacted in this way providing valuable statistical data and expressing their opinions of the merits of centralizing these cases. Of the 136 new cases admitted to hospital in the first half of 1952, 42 were of traumatic origin. Twelve of these 42 patients died within three weeks of their injuries, and 4 recovered so quickly that they were soon discharged. The nontraumatic cases numbered 94 and represented a variety of different diseases, such as disseminated sclerosis and tumors of the spinal cord. In this group there were 17 patients for whom the prognosis was bad because of the malignant character of their disease. Dr. Höök concludes that, with a population of 7 million inhabitants, Sweden has to deal every year with 80 to 100 new cases of paraplegia requiring special treatment. The physicians contacted were invited to express their opinions on the comparative merits of centralization of such patients or dealing with them in several hospitals. About 90% were in favor of the former alternative, and, while 9% were uncertain as to what procedure to follow, 1% preferred the *status quo*. Advocates of centralization may therefore count on much support from the outcome of this census.

Treatment of Tuberculosis with Isoniazid.—Reports on isoniazid treatment of tuberculosis coming in from different hospitals in Sweden emphasize both the merits and dangers of this new therapy. From the neurological department of the Serafimer Hospital comes a report by Dr. Olle Höök on polyneuritis as a sequel to isoniazid treatment. In cooperation with Dr. T. Bruce, who is in charge of the Söderby Hospital, he has come to the conclusion that in about 8% of the patients given this drug for more than a month lesions of the nervous system, with paresthesia in the hands and feet, are liable to develop. The average dose of the drug in his cases was 9 mg. per kilogram of body weight, and the average duration of the treatment before the appearance of polyneuritis was two months. This polyneuritis affects mainly the sensory nervous system and is distributed symmetrically, the lower limbs suffering most. Fortunately this condition appears to pass off quickly after the drug is withheld, but observation of these cases has not lasted long enough to warrant conclusions concerning the ultimate prognosis. Meanwhile, the possibility of severe and prolonged polyneuritis should be a check on careless dosage.

From the medical department of the Stockholm Fever Hospital (Epidemisjukhus) comes a report by Dr. L. Silverstolpe and Dr. G. Örndahl on the literature of tuberculous meningitis treated with isoniazid. They have found records of 45 such cases, and they show how favorable the outcome may be when this drug is given in combination with streptomycin and *p*-aminosalicylic acid. In other words, isoniazid is not, at present, to be relied on to effect a cure by itself. The same authors have published in *Nordisk medicin* for March 27, 1953, a detailed account of a 48-year-old man whose tuberculous meningitis (diagnosis confirmed by guinea pig tests and Löwenstein cultures) was treated ineffectively with a combination of *p*-aminosalicylic acid and dihydrostreptomycin for seven weeks. Isoniazid was then given in small doses, which gradually increased to 7.8 mg. per kilogram of body weight without producing any noteworthy side-effects. Meanwhile, the treatment with *p*-aminosalicylic acid and dihydrostreptomycin was discontinued. After five months' treatment with isoniazid alone, the general condition was considerably improved. The drug was discontinued after a total dose of 61.85 gm. had been given. After 291 days in hospital the patient was discharged free of headache and fever. The only side-effects in this case were mild and transient euphoria, slight eosinophilia, an increased pulse rate, and slight constipation.

From the psychiatric department of the Sahlgrenska Hospital in Gothenburg comes a disquieting report by Dr. Greta Tessing-Ericsson of three patients in whom alarming psychoses developed after prolonged treatment with isoniazid. One of them, a woman aged 31, had been given the drug for six months in doses up to 300 mg. daily (4.3 mg. per kilogram of body weight). Her psychosis began suddenly with slight irritation and sleeplessness, followed, after a few days, by increasing paranoid ideas and visual, olfactory, and auditory hallucinations. Recovery was slow when the drug was withheld.

CORRESPONDENCE

HEPARIN AND ANGINA PECTORIS

To the Editor:—In reference to the article "Clinical Evaluation of Heparin in the Treatment of Angina Pectoris" by Binder and his associates in THE JOURNAL (151:967 [March 21] 1953), there are several points I wish to consider. This problem is of more than passing interest, since the role of heparin in fat transport is being intensively investigated.

The persons studied were domiciliary patients residing at a Veterans Administration Center and nearly all of them had had angina pectoris for five years. This group would be resistant to therapy not only because of the long duration of angina with probably markedly calcific vessels, but particularly because the security of such patients in residence at a veterans' facility is threatened by any considerable improvement in symptoms. Under these circumstances both conscious and unconscious emotional factors operate to negate the effect of therapy, especially in instances in which a subjective response, chest pain, is being evaluated. Another point for discussion is the delayed gradual response to heparin and the prolonged carry-over after administration of the drug was stopped. This is by far the commonest type of response in atherosclerotic disease (*Am. J. M. Sc.* 224:487 [Nov.] 1952). In spite of this pitfall, therapy with each agent was given for only four weeks. Both the gradual delayed response and the after-effect, therefore, were not detected. I believe this to be so since the authors state "most patients experienced greater relief of angina during the second month of intravenous therapy, regardless of whether heparin or sodium chloride was used." Experience has shown that placebo therapy has its maximum effect immediately not in the second month of therapy. The group that received heparin initially improved more in the second month when saline was given because of the gradual response to and the prolonged effect of heparin after its administration is discontinued (sometimes up to several months), not because isotonic sodium chloride solution is a better placebo than heparin. The group, which received saline initially, improved more in the second month when heparin was given not because it is a better placebo but because the actual therapeutic response to heparin was beginning to manifest itself.

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HYPOPLASIA OF BONE MARROW AND RADIOACTIVE GOLD

To the Editor:—Several weeks ago a paper by T. W. Botsford, H. B. Wheeler, R. A. Newton, and W. E. Jaques entitled "Hypoplasia of Bone Marrow Associated with Radioactive Colloidal Gold Therapy" appeared in THE JOURNAL (151:788 [March 7] 1953). These authors, on a basis of studies of six patients with malignant disease and without any quantitative measurements of radioactive material in the marrow or long bones, claimed to have found hypoplasia of the bone marrow of significant proportions. After nearly seven years' experience with radioactive colloidal gold used in the treatment of human disease, our group has never been impressed by any bone marrow alterations when ordinary therapeutic quantities of material were given by the interstitial, intracavitary, or intravenous routes. The last route undoubtedly results in the deposition of some of the colloid in the bone marrow. Only in those cases in which amounts much larger than usual were used have there been any significant alterations in the formed elements in the circulation, and, in addition, such changes were transient. Any such changes followed the use of from four to six times the amount of material reported to have been used interstitially by the above authors. Such changes followed only when we administered, by the intravenous route, two to three times our own usual therapeutic amount in patients with leukemia. In a study of the effects of massive doses of radioactive gold colloid on dogs, it has been found that from 7 to 10 times the therapeutic dose used in humans on a basis of millicuries per kilogram of body weight could be given before transient leukopenia occurred.

Contrary to the claims of these authors, we feel that the safe dosage of radioactive gold, by any of the routes used to date, offers a considerable latitude with regard to toxicity. We have used 60,000 mc. of this material in several hundred patients and have never observed effects indicating that it should be thought of as a dangerous drug. Since there are so many opportunities for its use in the therapeutic and palliative fields at the present time, it seems unjustifiable to condemn such a valuable and versatile agent on a basis of limited evidence.

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HOSPITAL HARMONY

To the Editor:—It is obvious that in some hospitals the harmony that should be present among the medical staff, the lay board, and the administration is disappearing and that it may well be time to reexamine the situation and to define the relationship that must exist among these three groups. To meet its four generally accepted main functions, patient care, research, education, and preventive medicine, a voluntary hospital has as its basic organizational structure a triad composed of the medical staff, the board of trustees, and the administration. This triad is a three-way partnership, its common objective being to provide every patient with the high quality of medical care he has the right to expect. There should be no difference in the aims of the three partners, though there may well be legitimate differences of opinion concerning the methods to be used in achieving those aims.

The lay board is legally responsible for all acts performed in the institution by all persons connected with it, including the medical staff; no well-informed board would, however, make policy decisions affecting medical care without consulting with those who provide that medical care. In discussing problems with the medical staff, the usual mechanism used is the joint conference committee. The function of the medical staff is to provide medical care within the policy set by the lay board. The administration functions to interpret and implement that policy.

Administration of a hospital is not an end in itself, but only a means to the end that the hospital may give to its patients and, thus necessarily, to its medical staff, a consistently high quality of service. To function well, the administrator must not only control management detail but also act as liaison officer between the medical staff and the lay board. The administrator interprets to each the needs and problems of the other and attempts to eliminate any misunderstandings that may arise between the two.

Every institution is like a small town; it has its own peculiar values and behavior patterns. The administrator must protect his hospital's traditions and should never attempt arbitrarily to impose new values at the cost of the old. On the other hand, since his position is one of leadership, he should help to introduce new values when he, together with the medical staff and the lay board, deems it desirable.

One principle, however, should be understood and remembered. Good medical care cannot be created by legislation alone. The staff physicians are the basis of the medical care program because the standards of medical care in each hospital are ultimately dependent on them. The medical staff as a whole and each physician have needs and aspirations; it is the administrator's responsibility to meet those needs so far as possible. This is neither easy to accomplish nor can it be done speedily, since requests by the medical staff must be measured against the needs of the hospital. The administration, however, must stand ready to help the staff on both a group and an individual level.

In return, physicians can help the administrator by giving him sympathetic cooperation. A mutual trust should be present also, but this can grow only out of their dealings with each other. Because it has the responsibility of recommending medical policy and of implementing it when approved, the medical staff must deport itself well, promote talent, and reward industry. Perhaps most important of all, it must bear in mind the need to provide a training ground for young men so that they may assume leadership when opportunities arise. Some hospital functions are purely administrative, and some are purely medical. It is, however, a mistake to draw an artificial line of demarcation between the two. The medical staff must play an important role in management, if for no other reason than in the interests of economy. If physicians were invited to accept the responsibilities implicit in an active partnership, significant economies in operating costs could undoubtedly be effected.

Hospital administration is a perpetual exercise in human relations. Problems that may arise among the three partners must be solved by a sympathetic understanding of the facets and perplexities of each. The key to amicable solution of such problems lies in understanding of drives that motivate each person, working with each person through this understanding, and appealing to motivations as necessary.

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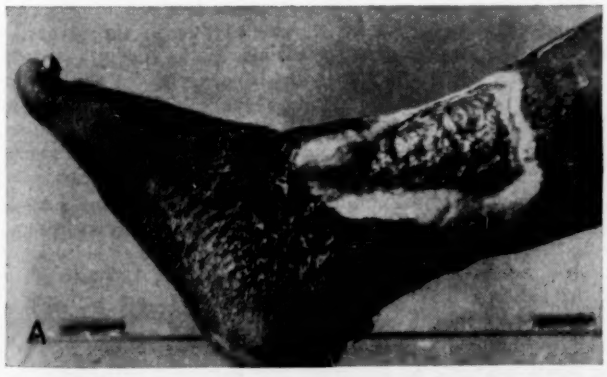
LYMPHOSTATIC VERRUCOSIS OF LOWER LIMB AMPUTATION STUMP

To the Editor:—Schamberg has recently pictured a lower limb amputation stump showing verrucose changes (*J. A. M. A.* **150**:1653 [Dec. 27] 1952). He cited it as an example of confluent, extensive verruca vulgaris but was unable to produce improvement after nine months' vigorous treatment with measures usually employed in the therapy of the common wart. Verrucose changes in the skin accompanying chronic edema have been well recognized for many years (Rojas, H. M.: Sobre la verdadera naturaleza del llamado "pie musgoso," *Crón. méd.*, Lima **40**:361, 1923. Pampana, E. J.: Sul "Mossy Foot." Descrizione dei primi casi Colombiani, *Arch. ital. di sci. med. colon.* **10**:465, 1929). Though seen in their most florid form in cases of filarial elephantiasis, they are of frequent occurrence in African Negroes suffering from other varieties of chronic edema. I first demonstrated the causative role of chronic lymph stasis in the production of a warty skin and gave the name lymphostatic verrucosis to this condition. (On the Probable Inclusion of Several Diseases in the Title " 'Mossy' Foot," *Ann. Trop. Med.* **28**:47 [March] 1934.) The photograph



marked "A" shows lymphostatic verrucosis in a Negro who had edema due to a chronic, sclerosing leg ulcer. Over 200 further cases were seen by Clark (Lymphostatic Verrucosis in the Fort Hall District of Kenya, *Tr. Roy. Soc. Trop. Med. & Hyg.* **42**:287 [Nov.] 1948), who adopted this proposed name and confirmed the relationship of chronic edema to the dermatosis. The condition responds to firm, prolonged pressure by elastic bandages.

In the last seven years, I have seen two cases of the same condition affecting a lower limb amputation stump; in each of these healing had been delayed after the amputation and recurrent attacks of inflammation had occurred in the stump. It is assumed that this inflammation had produced lymphatic blockage and thus had initiated the conditions required to

produce lymphostatic verrucosis. Lymphostatic verrucosis in an amputation stump (mid-calf) is shown in the illustration marked "B."

As lymphostatic verrucosis responds to elastic pressure bandages, which act by obliterating the engorged lymph spaces, an analogous form of treatment was devised in the second of my cases. In view of the impossibility of applying elastic pressure by bandaging an amputation stump, end-bearing pressure was supplied by inserting the bladder of an oval football (English rugby type, children's size) inside the artificial limb. This is easily done in such a way that the valve protrudes through a slot in the side of the prosthesis. After the artificial limb is secured in position, the bladder is inflated with a bicycle pump until comfortable, constant, end-bearing pressure has been procured. The use of this device resulted in disappearance of the verrucosis in three months, in the patient pictured here.

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SUBCLAVIAN VEIN OBSTRUCTION

To the Editor:—The obstruction of the subclavian vein reported by Horwitz and Zinsser in THE JOURNAL (**151**:997 [March 21] 1953) is of considerable interest, principally because of the excellent phlebographic demonstration of subclavian vein obstruction in the region of the crossing by the clavicle. This situation, however, is not so unique as one might infer from the lack of references to other similar cases already published.

The duration of symptoms in the patient reported on was quite brief, but nothing whatever is said about the circumstances surrounding the beginning of symptoms. It would be interesting to know whether this patient had been engaged in any unusual physical activity, particularly activity necessitating her to have her arm above her head. This patient's difficulty seems to fall in the category of effort thrombosis of the subclavian vein or the Paget-Schroetter syndrome. This latter designation was given by Hughes (*Surg., Gynec. & Obst.* **88**:89, 1949) in an article in which he collected some 300 cases of this sort from the literature. Another extremely interesting report that should be mentioned in reports of surgical amelioration of subclavian

vein obstructions is by McCleery, Kesterson, Kirtley, and Love (*Ann. Surg.* **133**:588, 1951). These authors report five instances of subclavian vein obstruction and arteriograms and descriptions of operative procedures which lead them to believe that the subclavius and the anterior scalene muscles together produce mechanical compression of the vein.

The report by Horwitz and Zinsser tends to confirm the ideas previously published by others that some of these venous obstructions result from vascular compression permitted by certain anatomic configurations without supervening thrombosis, and that relief can be given.

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MEDICAL HELP FOR KOREA

To the Editor:—A few months ago, THE JOURNAL carried an appeal by Major Gen. William Shambora for medical textbooks, references, equipment, and other items that could be used in the reestablishment of Korea's six medical schools. In March, as a member of a mission sent to Korea by the newly-formed American-Korean Foundation, of which Dr. Milton Eisenhower is chairman, I visited Korea to observe civilian health and welfare programs. At that time, the first shipments of books, equipment, and other supplies being voluntarily contributed by state and local medical societies and individual physicians were just beginning to arrive and to be distributed in Korea's medical schools. I cannot express adequately the impression that this gesture of voluntary concern of America's physicians for the people of Korea and the Korean medical profession is making both on the people of Korea and on American military medical officers nor can I convey the tremendous amount of good these contributions will do.

Although the peoples of the free world understand the ideological and political reasons for the presence of United Nations' troops in Korea, only the person who has actually been there can understand the full impact of the war on the Korean civilian population. Korea's current health problems started in 1945, when that nation was liberated from Japanese rule and when the Japanese professional and technical health personnel who had occupied the nation's posts of responsibility for 35 years departed. The great need then was for competent, trained personnel. Through their own resources and from outside aid from such groups as the Rockefeller Foundation, some heartening advances were made in training of personnel both in Korea and abroad, but then came the current conflict in which war enveloped most of the country twice and some parts of it four times, leaving nearly one million civilian casualties, 500,000 destroyed homes, 100,000 orphans, and 300,000 widows. Physical facilities were destroyed or taken over for military use. Nearly three million persons, or 13% of the population, became refugees or displaced persons. Water supplies, purification plants, and environmental health services were destroyed or damaged or broke down because of the lack of transportation, supplies, and personnel. Nearly two-thirds of the nation's 2,500 medical school graduates were called into military service, and currency inflation destroyed the financial structure of the medical and health services. Then came the inevitable epidemics of typhoid, dysentery, typhus, smallpox, and encephalitis that follow in the wake of destruction.

Through emergency measures, the officials of the United Nations Civil Assistance Command, working with their Korean counterparts in national and provincial health departments, have achieved one of the world's truly remarkable results in the control of epidemic diseases. To date nearly 80 million immunizations have been given for smallpox, typhoid, and typhus, and the incidence these diseases has dropped from 15,000 cases in 1951 to fewer than 5,000 in 1952. As 80% of the nation's general hospitals were destroyed and medical supplies and equipment are limited, a network of 500 public dispensaries throughout the country has been organized for emergency and outpatient care. Many of these dispensaries, however, are short of medicines, have no doctor, and really are medical facilities in name only.

Although amazing results have been obtained in view of the scope and severity of the problems in these emergency measures, the lack of funds, equipment, building materials, and personnel has prevented any large-scale attack on the major chronic health problems of tuberculosis, leprosy, and intestinal parasites. With serious and prolonged chronic malnutrition and exposure, the overcrowding in homes, and the lack of isolation facilities, tuberculosis rates have increased until it is conservatively estimated that 6.5% of the population has clinically significant tuberculosis and that 2.5% has active advanced cases and should be hospitalized. Rates are much higher among refugee groups; yet, there are only 100 beds for the treatment of patients with this disease.

Korea's primary problem in the care of both military and civilian casualties is the lack of trained personnel. The nation has 6,800 physicians, but only 3,500 were trained in medical schools. The rest are self-trained through study or by serving apprenticeships with practicing physicians or are oriented herb doctors. One-half of the 5,000 medical doctors are serving with the Republic of Korea military forces, and an additional 1,700 are working in public institutions, leaving only 800 physicians in private practice to care for 19 million persons.

High priority is being given by the United Nations Korean Reconstruction Agency to the reestablishment of the nation's six medical schools, most of which are now operating in temporary quarters. At Taegu, for example, classes met in the professors' homes until January, when the Korean Military Advisory Group moved its headquarters out of the school. The school's teaching hospital, which had been used by the Republic of Korea Army, was returned a few weeks ago. The U. N. K. R. A. has allocated about $750,000 for reconstructing, reequipping, and restaffing the school with Korean and foreign teaching personnel. About 40% of the teaching is done voluntarily by American and other United Nations medical officers in their off-duty hours, and this practice will increase to nearly 50% in the new semester starting this month. American medical officers who are not teaching are voluntarily devoting their off-duty time to the care of Korean civilian casualties. In provincial hospitals, in clinics run by local authorities and mission groups, and in hospitals for orphans, American and other United Nations physicians frequently work until late in the evenings, on weekends, and even when they can get away during their duty hours. In many instances, these physicians and the men of the line have furnished, through their own resources and the aid of friends back home, much of the equipment and supplies. Seeing these men work in the true humanitarian spirit of medicine in its highest sense was a deeply moving experience. At no time in my life have I been prouder of being an American physician.

The initial or emergency phase of the health problems of Korea has been ably met with emergency measures. Under the original plans, these responsibilities were to be assumed by the United Nations military commands during the actual fighting. The U. N. K. R. A. was to assume the responsibility for the long-term reconstruction of the medical as well as the social education and industrial economy of the nation six months after the end of the fighting. The prolongation of hostilities, however, has made it necessary to revise these plans so that the United Nations Reconstruction officials might start projects designed to help the Koreans help themselves.

Emergency aid must continue, but, at the same time, efforts must be made to establish productive projects that can in turn produce some of the goods and services that Korea so desperately needs. Recognizing that the economic reconstruction of the nation is fundamental to the reconstruction and maintenance of the health and social services, the United Nations relief officials, of necessity, must devote the largest part of the funds available to economic and industrial activities. The responsibility, therefore, for reconstruction of the health and social services must be assumed in a large measure by voluntary assistance. Millions of dollars worth of clothing, food, and relief and medical supplies have been sent to Korea in the last two and one-half years by missions, governmental groups, and voluntary agencies. This aid must continue and must be increased if starvation, disease, and unrest are to be controlled. Help, however, must also be made available for productive

projects in health fields that can attack the roots of Korea's fundamental health problems. Science, education, and technology are the answers to Korea's health needs. Each of us can help.

Services that have books, equipment, and other items may ship them to the Commanding Officer, Alameda Medical Depot, Alameda, Calif., Mark for KORMEDED, where the Department of the Army will assume responsibility for their shipment and distribution to Korean medical schools at which they will be of greatest use. The address is designed so that the Alameda Medical Depot may identify each box or package and so that each parcel may be segregated immediately and shipped to its intended destination. Without such identification there would be no means whereby the authorities at the depot could be sure of the intended destination of any given package, especially since that depot acts as shipping agent for gifts intended for similar though not indentical use.

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ALLERGY AND PROCAINE HYDROCHLORIDE

To the Editor:—The conclusion reached by Criep and Ribeiro in their article "Allergy to Procaine Hydrochloride with Three Fatalities" in THE JOURNAL (**151:**1185 [April 4] 1953) cannot go unchallenged. From a theoretical viewpoint, it is unlikely that three fatal plus "several other severe nonfatal" reactions would occur in one clinic in one year on an allergic basis. The incidence of true allergy to procaine is accepted as being extremely low, if in fact it occurs at all.

Although the use of procaine in bronchoscopy, except for bilateral vagus block, is somewhat surprising, we are even doubtful about what the authors mean by "the usual routine" with reference to technique and dosage. We doubt the assumption that the three deaths described were allergic in nature. The authors seem to have ignored other commoner explanations, such as bronchospasm in an asthmatic secondary to a foreign body (iodized oil) in the trachea (case 1), inadvertent intravenous injection or tension pneumothorax (case 2), and rapid absorption of epinephrine (Adrenalin) (case 3).

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COVERING THE SCALP HAIR AT OPERATIONS

To the Editor:—In visiting hospitals in different parts of the country one is struck by the number of surgeons who fail to take reasonable precautions against hair and dandruff falling into the operative field. This has been noticed in pictures of operations. A common practice is to turn up the bottom edge of the cap in a neat fashion, leaving uncovered the occipital region, from which loose hair, dust, and dandruff may fall into the operative field when the surgeon leans over the table. Such wound contamination can result in infection. Wound infections of unexplained origin still occur, though the incidence is less than formerly probably because of the general use of antibiotics. In marked contrast to the careless attitude of these surgeons is that of nurses, whose hair is generally adequately covered, often with a hood. On the other hand, anesthetists not infrequently are offenders, either through thoughtlessness or the fact that their distinctive school cap is designed more for appearance than as a hair covering. Adequate covering of the scalp hair of the operating room personnel should be observed as are other well-established basic requirements of aseptic technique. While operative technique can be only relatively sterile, a conscientious effort should be made to use all reasonable means to approach the absolute.

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COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

CERTIFICATION IN AVIATION MEDICINE

At its last meeting, the Council on Medical Education and Hospitals approved the request of the American Board of Preventive Medicine that it be authorized to certify candidates in two fields, public health and aviation medicine. All candidates for certification by this board will take the same basic examination in preventive medicine. Candidates for certification in public health will be examined further on their knowledge of that field, while those qualifying for certification in aviation medicine will take a special examination in this branch of the specialty. The Advisory Board for Medical Specialties took concurrent action in approving the request.

The Council, in collaboration with the American Board of Preventive Medicine, is currently developing standards under which schools of aviation medicine and residency programs in this specialty may be approved. Inquiry concerning approval of these programs should be made to the Secretary, Council on Medical Education and Hospitals, 535 N. Dearborn St., Chicago 10, Ill. DONALD G. ANDERSON, M.D., Secretary.

MEDICAL MOTION PICTURES

Cesarean Hysterectomy (Porro) PMF 5204: 16 mm., color, sound, showing time 19 minutes. Produced in 1952 by the Department of the Army. Procurable on loan from Area Surgeon of the Army Area in which the request originates.

This film shows the surgical procedure for cesarean hysterectomy. Anatomic landmarks throughout the operation are clearly indicated. The technique of the operation is not impressive, and the indication for the removal of the uterus in this case is not defensible. A simple sterilization would have accomplished the same purpose. Control of the bleeding during the operation could have been better handled. The skin exposure to the wound is not good technique. This picture is not recommended.

Fire and Your Hospital: 16 mm., black and white, sound, showing time 21 minutes. Produced in 1952 for the American Hospital Association and the National Board of Fire Underwriters by Audio Productions, New York. Procurable on loan ($4) from the American Hospital Association, 18 E. Division St., Chicago 10, or on purchase ($65) from Audio Productions, 630 Ninth Ave., New York.

This film uses a hospital of average size as an illustration of the fire hazards normally present in hospitals. It shows how a fire safety plan should be organized, how each department of the hospital should react to a fire alarm, how patients can be saved, and how fire spread can be reduced. The presentation deserves praise not only because of the clarity and credulity of the ideas expressed but also because of the high quality of the photography and the sincerity of the acting. The importance of this film is such that it is recommended for a biennial, or at least an annual, showing to the entire staff of every hospital. This film can also be shown advantageously to community groups and high school students.

NEW MOTION PICTURE ADDED TO A. M. A. FILM LIBRARY

Surgical Approaches to the Scapulohumeral Joint. Color, sound, showing time 30 minutes. Available through the Committee on Medical Motion Pictures. Service charge ($3.00).

A combination of anatomic demonstration, animated drawings, and operating room technique is shown. The various approaches are first shown by anatomic dissection, then retraced by animated drawings, and finally depicted by filming of actual surgical operations.

(A complete review was published in THE JOURNAL April 8, 1950, page 1098.)

MEDICAL LITERATURE ABSTRACTS

UNITED STATES

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Amyloid "Tumor Formation" of Skin. I. H. Holtzman and J. Skeer. —p. 187.
Effect of Roentgen Rays on Microsporum Audouini: In Vitro Study. K. Loewenthal.—p. 191.
Studies on Lichen Myxedematosus (Papular Mucinosis). J. E. Dalton and M. A. Seidell.—p. 194.

Corticotropin and Cortisone in Pemphigus Vulgaris.—Corticotropin and cortisone were used in the treatment of three patients with pemphigus vulgaris, two of whom had the acute and fulminating form of the disease and undoubtedly would have died without the use of these hormones. Observations on these two cases indicate that 20 to 25 mg. of corticotropin injected intravenously will effect subsidence of the temperature and pulse rate and promote a feeling of well-being within 24 hours after initiation. Continuation of this therapy will render a "toxic" patient "nontoxic" within a week to 10 days, at which time bullous lesions will show signs of involution. Supportive therapy is important, since lost fluids, electrolytes, and plasma proteins must be replenished. Antibiotic therapy, both parenterally and topically, which helps to control secondary infection is discontinued when the involution of the bullous lesions begins. In both of the acute fulminating cases the condition is now in complete remission in response to treatment with cortisone by mouth, in daily dosages of 90 to 100 mg. In the patient with chronic pemphigus with acute exacerbations, intravenous administration of corticotropin during his second hospitalization controlled the severe pruritus and effected rapid involution of the lesions, within 10 days, in contrast to the poor response to the intramuscular administration of corticotropin during the first admission. Intravenous injection of corticotropin was continued for 34 days, after which the patient was given cortisone by mouth, 300 mg. daily, which proved sufficient to keep the disease quiescent.

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Titles marked with an asterisk (*) are abstracted.

The Acne Problem.—In special studies on 350 patients with acne, Becker found no significant increase in androgen excretion as measured by urinary levels of 17-ketosteroids. Cultures of pustular lesions showed staphylococci similar to those found on the skin of normal persons. The orally administered antibiotics—oxytetracycline, aureomycin, chloramphenicol, and penicillin G—were beneficial in controlling the pustular element of acne, but sensitivity tests were not helpful in determining the most effective antibiotics. Estrogens proved useful adjuncts in nodular cystic lesions in both sexes, but especially in women over 25 who experienced premenstrual and menstrual exacerbations. Aqueous dispersions of synthetic vitamin A (palmitate) produced improvement in 46% and complete clearing in 10% of the patients with comedopapular acne. The author feels that each case of acne must be treated individually after a complete history is obtained and physical examination and laboratory procedures are carried out. Each etiological factor must be considered, and all measures must be taken to correct any remediable defect, such as anemia, hypothyroidism, and faulty dietary and living habits. Removal of focal infections has been emphasized by Andrews, and this author was impressed by the poor dentition of acne patients. Some endocrine disturbance seems to be involved, but in these patients there was no marked increase in androgen excretion.

American Heart Journal, St. Louis

45:161-318 (Feb.) 1953

*Ballistocardiographic Study of 369 Apparently Normal Persons: Analysis of "Normal" and "Borderline" Ballistocardiograms. W. R. Scarborough, F. W. Davis Jr., B. M. Baker Jr. and others.—p. 161.
Bilharzial Cor Pulmonale: Clinicopathologic Report of Two Cases. B. Girgis, S. Guirguis, R. Mowafy and H. El-Katib.—p. 190.
Chronic Constrictive Pericarditis and Rheumatic Heart Disease. A. J. Kaltman, J. B. Schwedel and B. Straus.—p. 201.
Ruptured Interventricular Septum and Ruptured Papillary Muscle in Two Cases of Acute Coronary Artery Disease. H. N. Segall and A. Sharp. —p. 209.
Electrocardiogram and Potassium Metabolism During Administration of ACTH, Cortisone, and Desoxycorticosterone Acetate. H. Ljunggren, R. Luft and B. Sjögren.—p. 216.
Effect of Valsalva Maneuver on Circulation: II. Role of Autonomic Nervous System in Production of Overshoot. E. I. Elisberg, G. Miller, S. L. Weinberg and L. N. Katz.—p. 227.
Experimentally-Induced Petechial Hemorrhage and White Embolization in Rabbit's Nictitating Membrane. A. L. Copley and R. Chambers. —p. 237.
An Interpretation of Incidence of Mural Thrombi in Left Auricle and Appendage with Particular Reference to Mitral Commissurotomy. J. B. Wallach, L. Lukash and A. A. Angrist.—p. 252.
Flicker Fusion Nitroglycerin Tests in Normal Young Adults. M. S. Chambers, M. C. Kozonis and R. E. Johnson.—p. 255.
Model Which Demonstrates the Quantitative Relationship Between Electromotive Forces of Heart and Extremity Leads. D. A. Brody and W. E. Romans.—p. 263.

Ballistocardiographic Study of Normal Persons.—Ballistocardiographic and electrocardiographic studies were made on 369 clinically normal persons from 20 to 84 years of age. The frequency of abnormal, borderline, and normal records was determined for each age-decade group. The most striking finding in this study was the surprisingly high incidence of abnormal ballistocardiograms in apparently normal persons above the age of 50. Abnormal records were present in only 4% of the subjects below 50 but in 55% of those above this age. The frequency with which coronary sclerosis is found at autopsy in persons who have died of noncardiac cause makes it apparent that this condition is an almost universal one in persons above the age of 40 years. It seems justified to assume that the abnormal ballistocardiograms from normal persons result from subclinical coronary atherosclerosis. Furthermore the great majority of patients with clinical coronary artery disease have abnormal ballistocardiograms and these records do not appear to be qualitatively different from the abnormal records of older normal persons. While these facts are suggestive, they do not provide conclusive proof for a causal relationship between ballistocardiographic abnormality and coro-

nary artery disease in clinically normal persons. Aside from purely cardiac causes, a number of extracardiac factors are believed to play a role in producing the ballistocardiographic abnormality observed in aging normal persons. Among these may be mentioned changes in the size and elasticity of the aorta and the larger arterial branches, changes in the lungs and pulmonary circulation, and peripheral and splanchnic blood pooling. If the effects of these extracardiac factors on ballistic form could be identified and separated, a sounder evaluation of cardiac function would be possible; until these factors can be separated it should not be assumed that the ballistocardiographic abnormality in clinically normal persons indicates coronary artery disease.

American Journal of Ophthalmology, Chicago

36:169-300 (Feb.) 1953

Anatomic Study of Peripheral Retina: III. Congenital Retinal Rosettes. C. C. Teng and H. M. Katzin.—p. 169.
Suction Anterior to the Iris as Factor in Narrow-Angle Glaucoma. A. Posner. —p. 185.
Comparative Effects of Cortisone on Rabbit Eyes Treated by Cyclodiathermy and Cyclo-Electrolysis. L. B. Sheppard.—p. 193.
Nonperforating Cyclodiathermy in Treatment of Glaucoma: Diathermia Retrociliaris. A. Urrets-Zavalía Jr. and A. Urrets-Zavalía.—p. 203.
Sympathetic Ophthalmia Following Cyclodiathermy. M. Bodian.—p. 217.
Di-Isopropyl Fluorophosphate (DFP) (0.01 Per Cent) in Chronic Wide-Angle Glaucoma. I. H. Leopold and A. F. Cleveland.—p. 226.
Ocular Pemphigus: Report of Case with Histologic Findings in the Cornea. P. S. Soudakoff and H. F. Whalman.—p. 231.
Surgical Treatment of Ocular Pemphigus. M. W. Friedman and E. S. Wright.—p. 237.
Kimmelstiel-Wilson Syndrome: Review of Literature and Report of Case with Ophthalmoscopic Findings. M. Cohen.—p. 243.
*Influence of Cortisone on Rate of Blood Absorption from the Eye. W. H. Benedict and R. W. Hollenhorst.—p. 247.
Nystagmus. C. W. Rucker.—p. 250.

Influence of Cortisone on Rate of Blood Absorption.—In a previous study, when it was found that cortisone had no effect on fibroplastic proliferation in dogs' eyes, it was noted incidentally that in hyphemic eyes, the blood was absorbed more slowly following the administration of cortisone. It was decided to pursue this observation further. The poor response to the use of cortisone and corticotropin in some forms of senile macular degeneration, in the disciform type of macular degeneration, and in inflammatory types of choroidal or retinal disease, in which there is a hemorrhagic component, might be partly explained if the hormones actually retard the rate of absorption of the hemorrhage. The same is also true in intraocular hemorrhage resulting from any cause. Experiments were made on rabbits, which indicated that the use of cortisone is actually contraindicated in eyes with intraocular hemorrhage. Cortisone injected subconjunctivally in hyphemic eyes retards the rate of absorption of the blood. Consequently, the use of cortisone is definitely contraindicated in the treatment of hyphema and probably also in the treatment of other conditions associated with intraocular hemorrhage.

Bulletin of Johns Hopkins Hospital, Baltimore

92:79-184 (Feb.) 1953

Resting Reticulo-Endothelial Cells and Their "Fluid Vacuoles": Reactions to Potassium, Tonicity and Albumin. E. H. Tompkins.—p. 79.
*Liver in Sickle Cell Anemia. T. W. Green, C. L. Conley and M. Berthrong.—p. 99.
Reverse Ductus: Presentation of Syndrome of Patency of Ductus Arteriosus with Pulmonary Hypertension and Shunting of Blood Flow from Pulmonary Artery to Aorta. J. F. Dammann Jr., M. Berthrong and R. J. Bing.—p. 128.
An Electron Microscope Study of Giant Chromosomes of Diptera by Means of Sections. E. Borysko.—p. 151.
Four Decades of Medical Progress. A. M. Chesney.—p. 171.

The Liver in Sickle Cell Anemia.—Of a large group of patients with sickle cell disease, 50 were studied with reference to hepatic function. The status of the liver in many of these patients has been evaluated both during crisis and at other times. Forty-five of the patients were examined by the authors, while data concerning the remaining five were obtained from the hospital records. Thirty-nine patients had typical sickle cell anemia, with persistent anemia, unremitting jaundice, and recurrent episodes of pain in the abdomen and extremities. Of the remaining 11 who had "atypical sickle cell disease," all at times had anemia, jaundice, and, with one exception, symptoms characteristic of sickle cell crisis. Five appeared to be heterozygous for the sickling character as determined by studies of their families. No patients having only the sickle cell trait were included in this series; however, five persons with the trait alone were studied with the same tests, and no hepatic dysfunction was found. The liver was palpable at some time during the period of observation in 33 of the 50 patients. Jaundice was invariably present in all of the anemic patients, but in three patients with atypical sickle cell disease, jaundice was usually too slight to be detected clinically although the serum bilirubin was at most times elevated above the normal level. The results of other liver tests are discussed and the histories of four patients, who had severe hepatic dysfunction are presented. The hepatic disorder seemed to be a specific manifestation of sickle cell anemia, and could not be explained on any other basis. The morphological changes were studied in the livers of 21 patients who died with severe sickle cell disease. These cases studied at necropsy were not identical with those studied clinically. Autopsy studies suggested that hepatic dysfunction probably can be explained by severe impairment of hepatic blood flow from the combined effects of anemia, the sickling of red cells in hepatic sinusoids and obstruction by Kupffer cells engorged by phagocytized red cells. The latter two processes are unique in sickle cell disease. Morphological evidences of hepatic cell injury and cirrhosis were seen in four cases. A number of mechanisms that might account for the development of the hepatic disorder in sickle cell disease are discussed.

Journal of Applied Physiology, Washington, D. C.

5:375-470 (Feb.) 1953

Experimental Production and Control of Abnormality in Acetylcholine Metabolism Present in Epileptogenic Cortex. D. B. Tower and K. A. C. Elliott.—p. 375.
Evaluation of Various Techniques for Screening Antimotion Sickness Drugs. H. I. Chinn and N. P. Plotnikoff.—p. 392.
Subthreshold Taste of Dilute Salt Solutions with Especial Referenec to Sodium Fluoride. G. J. Cox and J. W. Nathans.—p. 395.
Dermatomal Recruitment of Sweating. W. C. Randall and A. B. Hertzman.—p. 399.
Temperature and Blood Flow in Forearm of Eskimo. G. M. Brown, J. D. Hatcher and J. Page.—p. 410.
*Assay of Resuscitation Procedures. H. G. Swann, M. Brucer and B. R. King.—p. 421.
Ineffectiveness of Artificial Respiration in Rats After Drowning. H. E. Swann Jr., P. V. Karpovich and D. B. Dill.—p. 429.
Nutritional Level of Students and Nurses of Assam Medical College During the Winter Season, 1950-51. B. Banerjee.—p. 432.
Regulation of Blood Glucose in Human Fetus. C. A. Villee.—p. 437.
Residual Volume Measurement by Gas Expansion Method and Nitrogen Dilution Method. P. Dejours and H. Rahn.—p. 445.
Certain Aspects of Hemodynamic Response to Valsalva Maneuver. H. L. Price and E. H. Conner.—p. 449.
Factors Affecting Hematocrit Determinations: Trapped Plasma, its Amount and Distribution. C. J. Hlad Jr. and J. H. Holmes.—p. 457.

Assay of Resuscitation Procedures.—Swann and associates assayed resuscitation procedures on dogs with fulminating anoxia caused by breathing pure nitrogen. When the dogs showed abrupt collapse of systolic blood pressure, the relative efficacy of the following methods was investigated: (1) periodic insufflation with 5% carbon dioxide in oxygen or with 15% carbon dioxide in oxygen; (2) insufflation with oxygen by means of a positive and negative pressure resuscitation pump; (3) manual artificial respiration; and (4) the Eve (tilt board) procedure. A positive and negative pressure respiratory pump was found to be superior to periodic oxygen insufflation, in that it uniformly succeeded in resuscitating the dogs at a point 11 seconds later in the process of death. Similarly, the positive and negative pressure pump was 3 seconds superior to insufflation with 5% carbon dioxide in oxygen; the carbon dioxide at a 15% level was least effective of the insufflation method. Manual artificial respiration succeeded in only 19% of trials, the cause for its inadequacy being its failure to ventilate the lungs with even the minimum requirement of air. Attempted resuscitation of dogs by the Eve (tiltboard) method also fails in a large fraction of cases. The differences shown for the three methods involving insufflation are so small that for practical purposes all three may be considered equal in efficacy. These data reinforce the conclusion that the critical need in resuscitation is oxygen and that the method of giving it is immaterial, providing that it gets into the lungs.

FOREIGN

British Journal of Cancer, London

6:339-438 (Dec.) 1953. **Partial Index**

Chronic Lymphatic Leukaemia Associated with Malignant Disease. O. D. Beresford.—p. 339.
*Sarcoma of Uterus. W. J. Williams and G. Bancroft Livingston.—p. 345.
Pathology of Epithelial Cysts and Tumours in Jaws. R. B. Lucas.—p. 356.
Frequency and Significance of Mucin in Sweat Gland Tumours. B. Lennox, A. G. E. Pearse and W. S. C. Symmers.—p. 363.
Effect of Adrenocorticotrophic Hormone (ACTH), Cortisone and Hydro-Cortisone on Growth of Experimental Lymphoid Tumours in Chicks. N. Lannek.—p. 369.
Amethopterin: Toxic Tumour Growth Inhibitor. J. G. Bennette.—p. 377.
Carcinogenic Action of Aminostilbene Derivatives in Rats Maintained on High and Low Protein Diets. L. A. Elson.—p. 392.
Carcinogenic Activity of Metabolic Products of 3:4-Benzpyrene: Pathological Studies. P. R. Peacock and M. A. Head.—p. 407.
Carcinogenic Properties of 2-Amino-1-Naphthol Hydrochloride and Its Parent Amine 2-Naphthylamine. G. M. Bonser, D. B. Clayson, J. W. Jull and L. N. Pyrah.—p. 412.

Sarcoma of Uterus.—In about 20,000 gynecologic hospital admissions there were 25 cases of uterine sarcoma. The ages of these patients did not confirm the view that sarcoma of the uterus is much commoner in the postmenopausal woman. Menorrhagia and/or irregular bleeding was a symptom in 12 of these women and postmenopausal bleeding in 6 of them. In only 2 of the women was a correct diagnosis made before operation; in 4 the diagnosis was made at laparotomy; in 5 from a histological examination of specimens obtained by curettage; and in the other 14 the sarcoma was established following hysterectomy for "fibroids" and menorrhagia. The prognostic significance of various histological features were assessed. Proximity of tumor to blood vessels distinguished the highly malignant cases from those of lesser malignancy. Every patient showing such a relationship died within 18 months following diagnosis. The degree of cellularity and the percentage of giant cells were of no value in assessing prognosis. If the diagnosis is suspected either before or during operation, radical pelvic exenteration would seem to offer the best prognosis. If the diagnosis is unsuspected and the surgery has been incomplete, further treatment should be based on a careful consideration of the histological nature of the growth and the prognosis resulting from this.

British Journal of Dermatology, London

65:1-42 (Jan.) 1953

Relation of Deficiencies of Vitamin A and of Essential Fatty Acids to Follicular Hyperkeratosis in Rat. V. Ramalingaswami and H. M. Sinclair.—p. 1.

65:43-76 (Feb.) 1953

Hypothesis Concerning Pathogenesis of Systemic Lupus Erythematosus. S. C. Gold.—p. 43.
Sodium Chloride and Pigmentation. F. A. Whitlock.—p. 52.

Die Medizinische, Stuttgart

No. 7:207-238 (Feb. 14) 1953. **Partial Index**

Personal Experiences with Fenestration Operation in Otosclerosis. M. Meyer and H. Passow.—p. 207.
Treatment of Hemangioma in Newborn Babies and Infants. J. Erbslöh.—p. 210.
*Irradiation Therapy of Hemangioma. C. Montag.—p. 213.
Alizarin Test for Rapid Recognition of Impairment of Renal Parenchyma. G. Klavis.—p. 215.

Irradiation Therapy of Hemangioma.—Irradiation treatment, and particularly roentgen irradiation using a short focal-skin distance ("contact irradiation"), was given to 218 girls and 102 boys between the ages of four weeks and five years with hemangiomas. Of the 320 patients, 274 had one hemangioma, 35 had two, and 11 had multiple hemangiomas. Of the 364 hemangiomas, 332 were cutaneous and 32 subcutaneous. The scalp or the face was involved in 89 patients, the neck in 21, the trunk in 130, the upper extremities in 38, and the lower extremities in 42. The technique of short focal-skin distance roentgen irradiation is characterized by the sharp decrease in tissue dose, which is obtained by a relatively low tube voltage and by a very short focal-skin distance. At the first irradiation a dose of 500 r was given, and this dose was repeated at an interval of four weeks, and then several times at intervals of three to four months. According to the apparatus used, the focal-skin distance was either 2 cm. or 1½ cm. In cases of very deep hemangiomas, an exceptional focal-skin distance of 5 cm. was employed, but the single dose employed was reduced to from 300 to 400 r. No disturbing skin reaction resulted from these doses, and impairment of growing bones or epiphyseal joints could be definitely excluded. Irradiation of hemangiomas close to the testes or the ovaries was carried out by directing the cone of rays tangentially to the patient's body to exclude any risk of impairment of the gonads. The single irradiation lasted only a few seconds. All the 320 patients who were followed up for one and a half to eight years obtained complete healing of their hemangiomas with excellent cosmetic results in the absence of any scars in 101, and with good cosmetic results in 202 who showed small unconspicuous scars or little changes of pigment. Eleven patients obtained fair cosmetic results with somewhat more distinct scars and more pronounced changes of pigment. Undesirable side-effects such as a small depression in the cranial bones, atrophy of the soft tissues in the area of the angle of the mouths, and shortening of an extremity occurred in only 4 patients. Application of 1 to 2 mg. radium needles is required for certain localizations of hemangiomas such as between the orbits, or in extremely deep cavernomas. Irradiation with Bucky's (grenz) rays in doses of from 500 to 600 r at intervals of three to four weeks proved satisfactory for the treatment of nevus flammeus. Electrolysis is indicated for stellate angioma.

Geburtshilfe und Frauenheilkunde, Stuttgart

13:1-96 (Jan.) 1953. **Partial Index**

Prophylaxis and Therapy of Thromboembolism. A. W. Schwenzer.—p. 1.
The Natural Estrogens in Human Beings. E. Diczfalusy.—p. 14.
Observations on the New-Born of Diabetic Mothers. A. Majewski.—p. 25.
Paravertebral Anesthesia in Obstetrics. H. Aeppli.—p. 35.
*Hydatiform Mole and Toxoplasmosis: Infectious-Toxic Genesis and Case Histories of Recurrent Hydatid Mole. W. Bleier.—p. 57.

Hydatiform Mole and Toxoplasmosis.—According to Bleier the genesis of chorionic degeneration that leads to hydatiform mole has still not been completely explained, but of three women with hydatiform mole who were observed at the University Women's Clinic in Erlangen in the course of one year, two had serologic evidence of latent or chronic toxoplasmosis. The case of one of these women was of special interest, because her four successive pregnancies resulted in abortions and each time hydatiform mole recurred, although two fathers were involved in these four pregnancies. Repeated tests carried out in the course of several months revealed high serologic titers for toxoplasmosis, but following treatment with aureomycin and with fever therapy, these serologic titers gradually became negative. Serologic proof of chronic toxoplasmosis was furnished by the Sabin-Feldman dye test and by the Westphal complement fixation reaction. In one of the two other women with hydatiform mole a skin test and the reaction of the reticulohistiocytic system indicated toxoplasmosis. Whereas formerly dysfunction of the chorionic epithelium was considered a result of defects in the ovum, in recent years evidence has been produced that suggests that external damage of the chorionic epithelium by toxins or agents such as toxoplasma may play a role.

Irish Journal of Medical Science, Dublin

No. 326:49-92 (Feb.) 1953

Folklore, Fact and Legend. J. B. Fleming.—p. 49.
Routine Examination and Preventive Methods in Tuberculous Contacts. H. M. Purser.—p. 64.
*Uterine Denervation by Culdotomy: Preliminary Report. J. B. Doyle.—p. 73.

Uterine Denervation by Culdotomy.—Doyle believes that patients who complain of pelvic pain should be given pelvic exploration and biopsy by culdotomy prior to laparotomy. After the patient has been anesthetized, the vagina is cleaned with a detergent, a surface antiseptic is applied, and the vagina is wiped dry. A Guttmann speculum is inserted so that its blade lies against the anterior wall of the vagina. The cervix

is elevated toward the symphysis by traction on a suture placed at its base. The vaginal mucosa is grasped by Willett forceps at the lower margin of the cul-de-sac of Douglas (located with the aid of transillumination through the rectum). A transverse incision is made through the vaginal mucosa and the underlying muscular-fibrous tissue. No. 1 chromic absorbable surgical sutures are placed in the anterior and posterior margins of this incision and held so that they convert the incision into an oval orifice. The dependent point of the cul-de-sac is aspirated. The peritoneum is then incised, and its anterior margin held up by a purse string suture. Pelvic examination is readily carried out by the introduction of two fingers through the orifice. Traction on the suture that has been placed in the cervix causes even an anteflexed uterus to tip into second degree retroversion, which tends to carry the tubes backward and downwards. A plastic cervical spoon may be introduced through the culdotomy orifice. By applying gentle traction with the spoon, the tubes and ovaries can be demonstrated at the culdotomy orifice for photography when desired. Adequate visualization of the pelvic contents can usually be obtained by the use of the pelviscope, which consists of a right-angled retractor with two terminal lights and a set of two telescopes, which permit Foroblique and right-angle vision. The differential diagnosis between tubal pregnancy, corpus luteum cyst rupture, and intrauterine pregnancy can be made by culdotomy. The diagnosis of endometriosis and the early detection of ovarian carcinoma is also facilitated by culdotomy. By resecting from 1.5 to 2 cm. of the uterosacral ligaments, the preganglionic fibers as well as the uterovaginal ganglia lying in the ligaments and in the wall of the cul-de-sac are divided and separated. The author used this method of uterine denervation for the relief of dyspareunia in 9 cases and of dysmenorrhea in 23 cases; neither the vesical nor rectal function was impaired.

Medical Journal of Australia, Sydney

1:89-128 (Jan. 24) 1953

Women Over Fifty. F. A. Maguire.—p. 89.
Murray Valley Encephalitis: Complement-Fixation Techniques. M. Donnelley and L. French.—p. 93.
Aetiology and Treatment of Hypertension. I. Simpson.—p. 96.
Aetiology and Treatment of Hypertension. J. Isbister.—p. 99.
Influence of Barbiturate on Sympathetic Nervous System. E. R. Trethewie.—p. 100.

1:129-168 (Jan. 31) 1953. Partial Index

Immediate Management of Closed Chest Injuries. H. M. Windsor.—p. 134.
Histoplasmosis: Review, With Report of Fatal Australian Case. J. A. Inglis and R. E. Powell.—p. 138.
Case of Carcinoma "In Situ" Removed During Gastric Resection for Chronic Ulcer. R. Osmond.—p. 141.
Symptomless Metastasis to Testis from Carcinoma of Prostate. I. F. Potts.—p. 144.
Case of Calcifying Ependymoma of Right Lateral Ventricle. R. A. Money.—p. 146.
Occult Carcinoma of Breast. E. Goulston.—p. 147.
Acute Necrosis of Pancreas (Acute Haemorrhagic Pancreatitis) Causing and Presenting as an Acute Colonic Obstruction. T. F. Rose.—p. 147.

Nordisk Medicin, Stockholm

49:81-120 (Jan. 16) 1953. Partial Index

*Antibodies in Allergic Eczema. H. Haxthausen.—p. 81.
Present Viewpoints on Antibody Formation. A. Fagraeus.—p. 84.
Lymphocytes as Transmitters of Hypersensibility. T. Wesslén.—p. 87.
Hemagglutination in Rheumatoid Arthritis. N. Svartz and K. Schlossman.—p. 89.

Antibodies in Allergic Eczema.—Haxthausen's review points to many unsolved problems. The possibility that lymphocytes may directly or indirectly play a part in the eczematous reaction is suggested by the fact that there are normally many lymphocytes in the skin, not only in corium but up to the stratum spinosum of the epidermis. In the development of an eczematous reaction this steady emigration of lymphocytes from the blood to the skin is considerably increased. Lymphocyte emigration is one of the earliest symptoms in allergic eczema. By what means the lymphocytes transmit the reactivity to cutaneous cells is not yet understood. Allergic skin, transplanted to a normal subject, rapidly loses the ability to react to the antigen in question, while normal skin, transplanted to an allergic patient, acquires this characteristic. The transplantation tests show it is not the skin itself that forms the active principle. The sensitivity is produced by a factor supplied to the skin from within, probably by way of the blood. If an antibody absorbed by the skin is responsible for the reactivity of the skin, it must be loosely linked. Further evidence supports the assumption that the active factor is transmitted by the lymphocytes.

Ugeskrift for Laeger, Copenhagen

115:37-76 (Jan. 8) 1953. Partial Index

Treatment of Premature Infant. H. Buch and A. Gjersøe.—p. 43.
*Mode of Life and Capacity for Work of Patients After Resection of Stomach. B. Bjerre, J. Engberg and U. Feldthusen.—p. 46.
Sodium Excretion Through Kidneys and Sweat Glands in Normal Person on High and on Low Salt Diet. A. Warming-Larsen.—p. 49.
Low Spinal Analgesia with Glucose-Pantocain Solution. S. K. Sørensen.—p. 51.
Submucous Resection of Transverse Muscles of Larynx by the Krainz Method in Treatment of Bilateral Paralysis of Recurrent Nerve. B. Eriksen.—p. 53.
Osteotomy Treatment of Unhealed Fractures of Neck of Femur. J. Agerholm-Christensen and W. Permin.—p. 55.

Mode of Life and Capacity for Work of Patients After Resection of Stomach.—The authors traced 81 surviving patients of a group of 99 who had gastric resection from 1939 to 1949. The Billroth 1 procedure, usually with enteroanastomosis, was used in 94 patients, and the Billroth 2 procedure in five. Seven patients died postoperatively; seven have died since. Eighteen of the 81 are wholly free from symptoms. In 10 the results of the operation are not satisfactory, although 7 are subjectively improved; 3 are unable to work, and 5 have had to take on lighter work. In the middle group of 53 patients with subjectively good and objectively moderately good results, 43 present milder dyspeptic symptoms ascribable to sequelae of the resection. These patients can suppress and control practically all the symptoms by moderate restriction in the quantity or quality of their meals.

Zeitschrift f. Geburtshilfe u. Gynäkologie, Stuttgart

138:1-104 (No. 1) 1953. Partial Index

*Pathogenesis of Endometriosis. H. Petri.—p. 16.
Genital Tuberculosis and Pregnancy. E. Klees and H. G. Müller.—p. 54.
The Muscular Coat of the Human Oviduct. K. M. Herrligkoffer.—p. 63.
Is Active Treatment of Placental Polyps Justified? H. E. Roloff.—p. 88.

Pathogenesis of Endometriosis.—Petri lists and critically reviews the various theories that have been advanced to explain the pathogenesis of endometriosis. In 1937 following a review of the extensive literature he had come to the conclusion that Sampson's theory of retrograde menstrual implantation could not be generally applicable. In an effort to explain the different heterotopic manifestations of endometriosis he recognized that a trauma is always involved. Only the so-called distant disseminations were at first difficult to explain, because this was before the time that Huber brought proof of hematogenic dissemination. The only objectionable feature in Sampson's theory was that desquamated menstrual endometrial debris was supposed to be the starting material of heterotopic endometrial growth. The success of the experiments of Fuchs and Schmid induced the author to accept the theory of implantation, but he thought that endometriosis could not develop from desquamated menstrual endometrial debris, but that only fresh viable endometrium could be implanted and cause heterotopic growth. The author further comments on the fact that endometriosis is a "modern" disease. At any rate its great frequency is modern; it increased with the greater incidence of gynecologic operations and with the changes in sexual practices since the turn of the century. Even distant disseminations on the arm, leg, and thorax can be explained on the basis of hematogenic dissemination and trauma. Interruption of pregnancy, which is always found in the anamnesis of distant disseminations, can be regarded as the classical trauma; viable decidua becomes detached, reaches the blood stream, and becomes implanted.

BOOK REVIEWS

Amebiasis: Pathology, Diagnosis and Chemotherapy. By Hamilton H. Anderson, M.D., Professor, Pharmacology and Experimental Therapeutics, School of Medicine, University of California Medical Center, San Francisco, Warren L. Bostick, M.D., Associate Professor of Pathology Department of Pathology, School of Medicine, University of California Medical Center, and Herbert G. Johnstone, Ph.D., Professor of Parasitology, Parasitology and Mycology Section of Department of Medicine, School of Medicine, University of California Medical Center. Cloth. $11.50. Pp. 431, with 51 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 49 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, 1953.

The authors have compiled an excellent monograph on present knowledge of Endameba histolytica and amebiasis for the clinician and the laboratory worker. After an introductory historical chapter, there are chapters on endemiology, etiology and pathogenesis, pathology (four chapters, including one on experimental amebiasis in animals), complications and sequelae, symptomatology and clinical manifestations, laboratory diagnosis, prevention and public health aspects, chemotherapy and supportive therapy, and requirements for growth and control of the parasite in vitro.

The authors stress the labile balance between invasiveness of the parasite and resistance and immunity of the host. At one extreme are persons with extensive amebic ulcerations of the intestine and, sometimes, with hepatic abscesses and other metastatic foci. At the other extreme are the healthy carriers whose immune responses prevent tissue invasion and force the ameba to multiply and survive in the lumen of the intestine. The authors apparently do not believe that the latter situation prevails to any great extent. They probably would not agree with C. A. Hoare's view that the majority of carriers have only the so-called minuta forms, which represent an essential stage in the life cycle of E. histolytica but lead a purely commensal existence in the lumen of the intestine. Hoare recognizes, however, that a shift in virulence can cause such forms to become the tissue-invading hematophagous amebas. The authors take the viewpoint that, although such truly healthy carriers may exist, they should be treated when diagnosis is certain and other circumstances warrant, because host resistance may be lowered.

In the valuable chapter on chemotherapy and supportive therapy the authors point out that emetine hydrochloride is effective only against amebas in the tissues and not against those in the lumen of the intestine or in necrotic or fibrous masses. They question whether emetine has any place in current therapy, since chloroquine phosphate is being used for hepatic amebiasis, and the newer antibiotics, such as fumagillin and oxytetracycline are being used for enteric amebiasis. They emphasize that the newer agents, in the dosage schedules employed, hold little hazard for the patient compared to the hazards of emetine.

The authors are to be commended on their conservative views and the general accuracy of their statements. They give special attention to unsolved problems in the present knowledge of amebiasis. The book is well written and adequately illustrated. There is some repetition, but it is probably justified in that it correlates overlapping divisions of subject matter. Comprehensive bibliographies and adequate author and subject indexes are included.

Gynecological and Obstetrical Pathology. By Peter A. Herbut, M.D., Professor of Pathology, Jefferson Medical College, Philadelphia. Cloth. $12.50. Pp. 683, with 428 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1953.

This book is intended for the undergraduate medical student, general practitioner, gynecologist, obstetrician, and pathologist, or for anyone interested in the pathology of the female generative system. Diseases are presented from a regional point of view; in order of discussion, pathological states of the vulva, vagina, cervix, body of the uterus, fallopian tubes, ovaries, and placenta are covered. In each section disorders are classified as congenital, inflammatory, neoplastic, or mechanical. There are also short chapters on embryology and physiology of the female generative organs. In discussion of nearly all the subjects the author gives the definition, incidence, cause, gross appearance, microscopic appearance, complications, clinicopathological correlation, diagnosis, treatment, and prognosis of the condition. Although the author is a pathologist, he has suggested therapy that is advocated by most gynecologists. At the end of each chapter is an extensive list of references. This book is not only a textbook but also an encyclopedia of obstetric and gynecologic pathology, because it mentions practically every pathological disturbance encountered in gynecology. The book is well written; the illustrations are numerous, clear, and instructive; and the index is extensive.

Surgery of the Œsophagus. By R. H. Franklin, M.B., B.S., F.R.C.S., Surgeon, Post Graduate Medical School of London. Cloth. $8.50. Pp. 222, with 86 illustrations. Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1952.

The material in this small book on surgery of the esophagus is well presented. The approach of the author is refreshing, since the book is directed mainly to general surgeons. The author in no sense minimizes specialization but rather clarifies those zones he refers to as "no-man's-land of surgery." He states that "it is as absurd for the chest surgeon to limit his excision of the oesophagus in all cases to the level of the diaphragm, as it would be for the abdominal surgeon always to to stop short below the diaphragm, even though the growth invading the stomach is extending higher than he had thought." Emphasis has rightfully been placed on the cooperation that is essential in some cases among the plastic surgeon, the radiotherapist, and the otorhinolaryngologist.

The chapter on reflux esophagitis, peptic ulcer of the esophagus, hiatal hernia, and short esophagus and the chapter on pouches and diverticula are particularly well written. Several minor shortcomings in no way detract from the overall worth of the book. Some mention and emphasis should have been made of the phrenoesophageal membrane. Figures 2 to 8 inclusive, showing cross section anatomy, could be improved, and the color plates depicting pathological specimens lack detail and clarity. This work is timely, readable, and informative; it is recommended to anyone interested in surgery of the esophagus.

The Pharynx: Basic Aspects and Clinical Problems. Edited by Abraham R. Hollender, M.D., F.A.C.S., Attending Otolaryngologist and Chairman of Service, Mount Sinai Hospital of Greater Miami. Cloth. $15. Pp. 560, with illustrations. Year Book Publishers Inc., 200 E. Illinois St., Chicago 11, 1953.

The pharynx is a site of extensive clinical interest to specialists and general practitioners because it serves as a portal of entry for many micro-organisms and because of its contiguity to the digestive and respiratory tracts. This new book on the pharynx is divided into five major sections that describe such fundamentals as anatomy, bacteriology, and physiology; the clinical problems associated with the nasopharynx; acute and chronic diseases of the mouth and pharynx; the uvula, salivary glands, infections of the neck, and pharyngeal diverticula; tuberculosis, syphilis, and neoplasms; and the relationship of tonsillectomy and adenoidectomy to poliomyelitis, rheumatic fever, and allergy. Since the book is a collaborative effort of 19 contributors in addition to the editor, it is refreshing to have the editorial introductions and comments on the material by the contributors. The book is well organized, contains an adequate bibliography, and is competently illustrated. It should serve as a practical and useful guide for all physicians interested in pharyngeal disease.

The reviews here published have been prepared by competent authorities and do not represent the opinions of any official bodies unless specifically stated.

QUERIES AND MINOR NOTES

DRENCHING NIGHT SWEATS

To the Editor:—*A 34-year-old diabetic patient complains of drenching night sweats. Some nights she has to change her bedding two or three times. She requires 50 to 60 units of isophane (NPH) insulin a day, and her diabetes is poorly controlled, because she does not stick to her diet and is a labile diabetic. The night sweats continued, however, even when she was hospitalized and her disease was well-controlled. Roentgenograms of her chest, her temperature, her basal metabolic rate, and her blood cell counts are all normal. Suggestions as to treatment would be appreciated.*

James E. Spens, M.D., Alpena, Mich.

Answer.—In any diabetic patient taking insulin, hypoglycemia or a rapidly falling blood sugar level must be considsidered as a possible cause of sweating. Since the patient's diabetes is poorly controlled and since she does not "stick to her diet," she should be hospitalized. Urine tests should be made every two hours during the day and every three hours during the night. Blood sugar tests should be made frequently during both the day and the night and especially when the patient is sweating. For steady control, it may be necessary to give a holding dose of long-acting insulin with three or four small supplementary doses of quick-acting insulin. Sweating is an unusual symptom in diabetes, but, in less aggravated form than that described by the questioner, it is occasionally encountered both generally and locally. In one instance sympathectomy was done for a sweating arm. Apart from the causes of sweating in diabetes, the common causes of hyperhidrosis must be considered. These are chronic febrile conditions, hyperthyroidism, and nervous or emotional strain and lability. In the patient in question, careful recording of variations in the body temperature both during the day and at night and further studies to rule out chronic infections are indicated. The emotional status of the patient must be considered. Often patients with labile diabetes are also unstable from the standpoint of the nervous system, with overactivity of the sympathetic component. This patient at 34 is presumably not at the menopause. Treatment, other than symptomatic, will depend on the cause, if it can be found. If the sweating is due to hypoglycemia, adjustment of the diet and the insulin dose, including provision for small night feedings if indicated, should be accomplished. Infections should be eliminated. In emotionally labile persons, administration of phenobarbital in small doses together with belladonna, atropine, or methantheline (Banthine) may be of help.

LOW-GRADE FEVER

To the Editor:—*A 4-year-old girl has moderate secondary anemia, frequent attacks of tonsillitis, and a chronic postnasal drip. In June, 1952, she began to run a low-grade fever that was thought to be due to infectious mononucleosis. On June 29 her heterophil antibody titer was positive in 1:7 dilution, and on Nov. 8 it was positive in 1:12 dilution. Urinalysis, stool examination, blood culture, tuberculin skin test and roentgenograms of the chest are all negative. What is your opinion?*

D. R. Foster, M.D., Hale Center, Texas.

Answer.—On the basis of the heterophil antibody titers it can be stated with some confidence that infectious mononucleosis was not present on June 29, or Nov. 8, 1952. The apparent absence of splenomegaly and adenopathy are of corroborative value. Acute infectious mononucleosis could, however, have been present at some time during the intervening 132 days. Proved examples of recurrent infectious mononucleosis are rare. Moreover, each attack is accompanied by a diagnostic level of heterophil antibodies. This consultant has never encountered a patient with chronic infectious mononucleosis. If there is a significant acceleration of the sedimentation rate or electrocardiographic changes in the intervals between the attacks of tonsillitis, rheumatic fever should be considered. These abnormalities are of a low order and disappear promptly after an attack of infectious mononucleosis. The basic problem is one of fever of undetermined origin and recurrent tonsillitis. Definitive treatment of the tonsillitis would depend on bacteriological studies. Beta hemolytic streptococci are usually responsible for recurrent tonsillar infections. Chronic paranasal sinus infection should be ruled out. The following studies are essential for other than a speculative approach to the problem of fever in general and infectious mononucleosis in particular: complete blood cell counts, heterophil antibody titer determinations, and liver function tests repeated at definite intervals.

BLOOD PRESSURE

To the Editor:—*In taking a blood pressure reading, occasionally sound first appears as the mercury goes up at a considerably lower level than it disappears as the mercury goes down. 1. What is the explanation for this? 2. Which level should be taken as the diastolic pressure? 3. Are the systolic and diastolic pressures as estimated with the sphygmomanometer the true pressures in the artery?*

D'Arcy Prendergast, M.D., Toronto, Canada.

Answer.—1. The probable explanation for the phenomenon described is that, as the mercury is going down, a small pressure wave entering a poorly filled artery causes sound owing to production of turbulence or a preanacrotic phenomenon of Erlanger. As the mercury goes up this does not happen, because the artery below the cuff is filled. The problem needs to be studied. 2. The level as the mercury goes down should be taken as the diastolic pressure. 3. Within 2 to 15 mm. Hg, the pressures determined with the sphygmomanometer are true pressures.

BLOOD ALCOHOL DETERMINATIONS

To the Editor:—*In the near future, I will have to make blood alcohol determinations to evaluate drunkenness, and it would be more convenient to do so six to eight hours after the blood is drawn. Will the accuracy of the test be affected by this delay?*

M.D., Wisconsin.

Answer.—Containers for the collection of blood samples for alcohol determinations should contain about ½ gm. of sodium fluoride. About 3 to 6 cc. of blood are added, the stopper is replaced, and the specimen is shaken. The sodium fluoride not only preserves the alcohol for many weeks but also prevents coagulation of the blood. The State Board of Health of Wisconsin has been furnishing tubes for blood chemistry determinations that contain sodium fluoride and thymol. These tubes must not be used for blood that is to be tested for alcohol. Although thymol has a high boiling point, it nevertheless distills with steam, interfering with the test for alcohol.

pH OF SALIVA AND TOOTH DECAY

To the Editor:—*Is there any treatment that will raise the pH of saliva in a person who is in excellent health and has no evidence of oral infection? A patient, aged 26, has saliva with a pH of 5 to 5.5, and he has persistent decalcification and decay of teeth.*

J. F. Steffen, M.D., Wabash, Ind.

Answer.—The salivary pH in this case is unusually low and approaches the value to be expected in certain mouths after rinsing with sugar solutions. Since no data are given concerning the method of obtaining this pH reading or the conditions, such as time of day and relation to food intake, under which the measurement was made, it is suggested that a more complete study of the reaction of this patient's saliva might produce more reliable information. As far as is known, there is no treatment that will raise the pH of the saliva. The hydrogen ion concentration of the saliva has been stated to vary directly with the

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carbon dioxide content of the blood; i. e., when the carbon dioxide tension in the blood is high, more carbon dioxide finds its way into the salivary secretion to lower its pH, and vice versa. Conditions associated with retention of carbon dioxide in the blood cause increased excretion of the gas in the saliva and increase its acidity. Ingestion of sodium bicarbonate, while it reduces the acidity of the urine, increases that of the saliva, since a rise in the carbon dioxide tension in the blood results (Best, C. H., and Taylor, N. B.: Physiological Basis of Medical Practice, ed. 5, Baltimore, Williams & Wilkins Company, 1950, p. 494). It would be well to study comprehensively the blood chemistry and dietary habits of this patient.

Several investigators have been unable to show any relation between the reaction of saliva and the incidence of dental caries. The belief that an acid reaction of the saliva is harmful and that it is desirable to change it from acid to alkaline is probably without scientific basis. It is suggested that this patient be referred to a competent dentist for treatment of the decalcification and decay of the teeth. These manifestations usually can be eliminated and their incidence reduced by proper restorative dentistry and, when indicated, by restriction of carbohydrates in the diet. The use of alkaligenic dentifrices is likely to be of little value in this case, but topical sodium fluoride applications, under the supervision of a dentist, may afford some protection against further occurrence of the dental lesions.

GASTRIC RESECTION

To the Editor:—*In gastric resection, is it exceptional to partially close the gastric stump, then anastomose the remaining opening to the jejunum? It is my impression that few if any resections are done in which more than a fourth of the stomach is left. Is this true?* *M.D., Alaska.*

Answer.—When gastric resection is done, it is usually wise to close partially the gastric stump before making an anastomosis with the jejunum. This is done to prevent a too rapid emptying of the stomach into the intestines, with the possible production of the so-called dumping syndrome. The modification in the technique of gastric resection introduced by Hofmeister had this purpose in view. When resection of the stomach is performed for the treatment of duodenal ulcer, most surgeons now advocate removal of from two-thirds to three-fourths of the stomach, including all of the pyloric antrum. In actual practice it must be admitted that in many patients only the lower half of the stomach is resected for this disease. This is usually because of the great difficulty of making an accurate estimate of the size of the stomach at the time of operation. When resection of the stomach is done for the treatment of carcinoma, the present trend is toward more extensive removal of normal tissue on all sides of the carcinoma. At present, a few surgeons recommend total gastrectomy for all gastric cancers. Wide removal of the lymph node bearing area along the lesser and greater curvatures of the stomach is desirable, along with removal of most of the omentum.

EXCHANGE TRANSFUSIONS IN INFANTS

To the Editor:—*In a case of erythroblastosis fetalis, how much Rh-negative blood is required to entirely replace the blood of the newborn infant? What are the important characteristics of animal blood that prevent use of whole animal blood or animal plasma or plasma fractions? What changes take place in human blood immediately after death? The question has arisen why the blood removed from the corpse by morticians in the embalming process cannot be employed in some useful manner.* *L. D. Arbuckle, M.D., Savannah, Ga.*

Answer.—How much Rh-negative blood is required to replace entirely the blood of the newborn infant with erythroblastosis fetalis depends on the weight of the infant and its red cell mass and on the red cell mass of the donor's blood. Since the replacement of the baby's blood by Rh-negative blood can not be achieved by first exsanguinating the infant and then transfusing the Rh-negative cells, the technique of exchange transfusion consists in transfusing Rh-negative cells, then withdrawing blood from the infant, again transfusing Rh-negative cells, again withdrawing blood from the infant, and so on until, after many repetitions of this procedure, almost all cells in the circulation of the recipient are Rh-negative. Wiener has estimated that to remove 98% of the infant's cells about 1,000 cc. of normal donor blood is necessary. In many instances, however, such a complete exchange transfusion is unnecessary. For a detailed discussion of these problems, the excellent monograph of P. L. Mollison (Blood Transfusion in Clinical Medicine, Charles C Thomas, Publisher, Springfield, Ill., 1951) may be consulted.

The proteins of animal blood are all antigenic to man when administered parenterally, and this precludes any in vivo utilization of animal blood.

Blood clots immediately after death, and the clots are later digested by activation of the fibrinolytic enzyme system of the plasma. In cases of sudden violent death, immediate activation of the fibrinolytic enzyme system may occur, and this apparently prevents post mortem clotting of the blood. When plasma or serum is examined up to eight hours after death no particular alterations are demonstrable. Postmortem blood fractions have been used for therapeutic administration by a few investigators. Objections to utilization of postmortem blood are related to the fact that the disease process causing the death may have led to undesirable alterations of plasma proteins and that bacteriological contaminations are difficult to avoid.

HEMOGLOBIN DETERMINATIONS

To the Editor:—*A 26-year-old woman was to undergo cesarean section on Nov. 12, 1952. Had she been permitted to deliver spontaneously, the date would have been Nov. 30. On Nov. 6, the hospital laboratory reported her red blood cell count to be 3,700,000 per cubic millimeter and her hemoglobin level to be 8.2 gm. per 100 cc. A few hours before the operation, on Nov. 12, the same laboratory did another blood cell count and reported 4 million red cells and 10.8 gm. of hemoglobin. Two hours later, the hemoglobin determination was repeated, and the same result (10.8 gm.) was reported. Hemoglobin determinations are done in this laboratory by means of a photoelectric colorimeter. The patient had no fever or diarrhea, and no transfusions or infusions were given during the period in question. To explain the discrepancy, I considered the following possibilities: 1. Prior to Nov. 10 the weather was hot; the patient sweated some and probably drank much water. Since Nov. 10, it has been cool; this may have caused her to drink little and may have led to hemoconcentration. 2. The patient spent the preoperative night at home, came to the hospital at 7 a. m. and was operated on at 10 a. m., without premedication. She was tense and nervous; her bladder, which was emptied just before she came to the operating room, was half full when the abdomen was opened. There is no question that she had a nervous polyuria, probably all through the night. Can that have led to hemoconcentration? 3. There may be a shift to hemoconcentration in the last weeks of pregnancy. 4. The figures obtained may represent poor laboratory work. What is your opinion?* *M.D., Texas.*

Answer.—It is impossible to answer the question in any exact way. It may be that the first hemoglobin determination with a value of 8.2 gm. per 100 cc. was erroneous. It should be pointed out that photoelectric colorimetry is by no means foolproof, and, although it does away with individual variations of estimating color, the photoelectric colorimeter requires care in setting the zero point and in handling. Furthermore, errors in preparing the solution for reading in the colorimeter are always possible. Sahli pipets, if not properly calibrated, may introduce an error of about 30%. In the last weeks of pregnancy there is no tendency to hemoconcentration but rather to hemodilution, and the exact level of circulating hemoglobin can be determined only by simultaneous determination of the circulating blood volume. That an increase or decrease of fluid intake over a longer period of time may influence the plasma volume cannot be denied. Since no statements about quantitation of fluid intake during the period mentioned are made, the validity of such speculations is doubtful.